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NEW YORK, SATURDAY, APRIL 23, 1927

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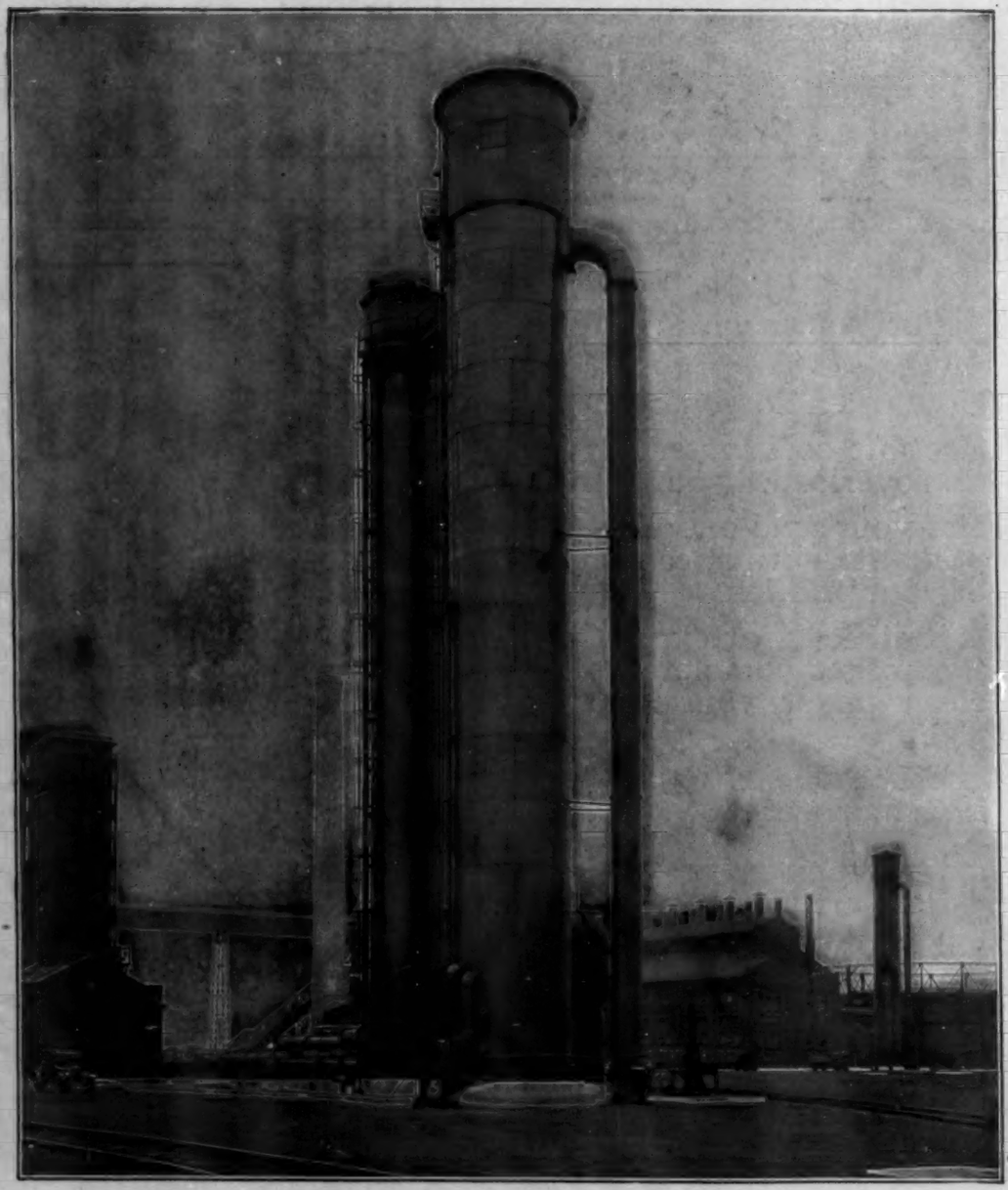

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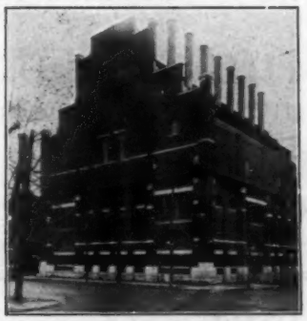
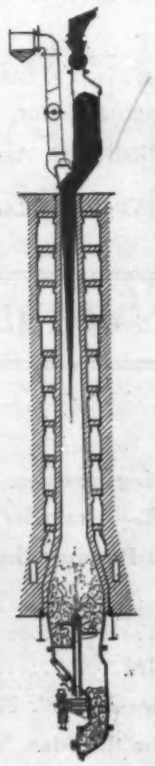
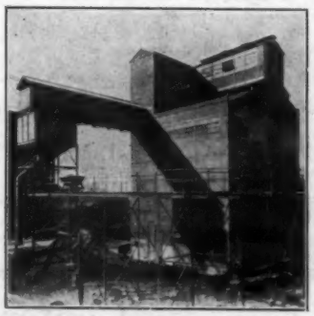
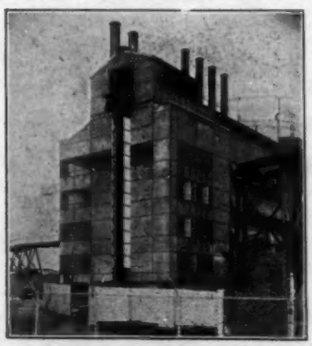


Toronto, Ont.
5,000,000 cu. ft. per day

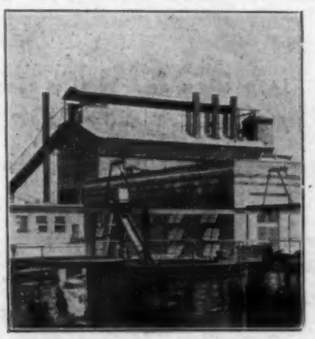




Fargo, N. D.
800,000 cu. ft. per day



Portland, Me., 2nd Plant
750,000 cu. ft. per day



Fall River, Mass.
1,600,000 cu. ft. per day

Plants *Completed* in 1926

Also Completed—Stamford, Conn., 1,100,000 cu ft.; Buenos Aires, 3,500,000 cu. ft.

Under Construction

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Toronto, Ont.	600,000 cu. ft.	Pawtucket, R. I.	1,060,000 cu. ft.
		Faribault, Minn.	400,000 cu. ft.

WEST GAS IMPROVEMENT CO.

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SIXTY-SEVENTH YEAR

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AMERICAN
GAS JOURNAL
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Insulation and the House Heating Problem

How lining walls, roofs and floors of buildings is "doing its bit" to hasten the day when gas will be the universal heating fuel

Robert C. Nason

TWO outstanding features of the science of heating now receiving close study by engineers everywhere are insulation of outer building surfaces and the use of gas as fuel. Many of those in the gas industry believe, and with sound reasoning, that it is only a matter of time when gas will be the dominant house heating fuel. Its convenience is coming more and more to be realized and objections as to cost will gradually disappear when insulation is installed, and the economy of this practice is almost daily being broadcasted as fresh evidences appear. In fact, it is not illogical to venture the assertion that it may be through insulation that gas will come into its own in warming the homes of the nation as well as supplying the fuel for cooking, refrigeration and similar uses.

The major ways in which interior heat is lost to the atmosphere are by transmission through roof, window glass and walls and in leakage of cold through cracks about window frames, doors, fireplaces and at similar points. In the average dwelling it is estimated that about 45 per cent. of the heat loss is through doors and windows and 55 per cent. through roof and walls. Weather stripping may be installed to reduce the loss through cracks, but it remains for insulation to prevent excessive loss through roofs and outer walls.

Typical Heating Calculation

A typical heating calculation has been made in the publication of the American Gas Association, House Heating, of a room 14 x 24 x 11 ft. high. The total heat loss is found to be 17,318 British thermal units (B.t.u.) per hour, made up of loss through window glass, which is 6,048 units; through walls, 5,086; leakage, 4,656, and floor, 1,528 units. In this case about 40 per cent. of the total loss occurred through walls and floor and 60 per cent. through window glass and leakage. Had this been a top floor room with a slate, wood shingle or tin roof of average construction the total heat loss for the same room would have been 27,552 B.t.u.. of which the loss through the roof would represent 37.1 per cent, that through walls 18.4, through floor 5.5, through windows 21.9, and by leakage 16.9 per cent. The loss from glass and leakage, largely unpreventable, is 38.8 per cent, and that through walls, floor and roof, much of which can be prevented by insulating, is 61 per cent. The proportionate losses are here shown in the accompanying graduated chart. (Fig. 1.)

A square foot of plain, brick wall, 13 inches thick, permits a loss of 0.28 heat units per hour per degree of difference between outer and inside temperatures. But if this is furred and plastered the same material permits loss of only 0.20 units. If materials of high insulating value are placed between wall and sheathing or between studding and sheathing saving both in fuel and in cost of the heating plant results. Cases are not unknown where economy of 50 per cent or greater are effected by insulation and in almost all cases saving amounts to at least 20 per cent.

Data on Ashenhurst Residence

One of the most widely discussed insulated residences and its Bryant gas fuel heater is that of H. S. Ashenhurst, Chicago. This installation was the subject of a scientific paper presented before the annual convention of the American Society of Heating and Ventilating Engineers by Messrs. H. S. Ashenhurst and S. R. Lewis, both members. The insulating material used was Insulex, 3⅝ inches thick, applied to interior of walls and roof between studding, and 2-inch thick layer of the same in the first floor. Plaster boards sheathed the interior walls, being placed directly over the Insulex. This two-story residence was successfully warmed during the 1925-1926 heating season with 321.5 square feet of hot water radiation. Had insulation not been

employed engineers have calculated that 711 square feet of hot water radiation would have been required.

The total cost of the Insulex, a porous material of plaster of paris and other substances, was $432. A direct result of the installation of Insulex was a saving in radiation, valued at $2 per square foot, amounting to $779 for 389.5 square feet. Deducting the cost of the insulation and its application, $432, the net saving in radiation alone was $347. The cost of heating the building, estimated from gas bills and reliable data, represented a further saving of $180 in fuel, which, added to the $347, makes a total saving of $527, disregarding the saving in cost of heating plant, one size smaller, which ordinarily would have been used.

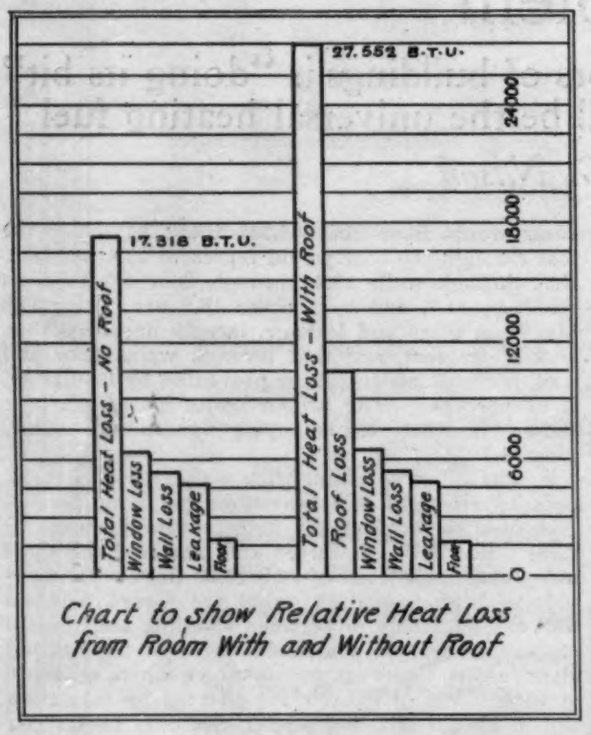

Figure 1

Other Typical Cases

Data covering fuel economy and cost of plant are numerous. W. H. Larimer, Pittsburgh, whose three-story house was insulated with Armstrong corkboard, 2 inches thick, heated his house during the season 1924-25, using natural gas at 60 cents per thousand feet, for $98. He estimates that without insulation the heating cost with the same fuel would have been $145. The fuel saving was $47, or 32 per cent.

J. W. Walker, Auburn, N. Y., whose residence was also corkboard lined, heated his 13-room country house with 567.5 square feet of radiation, whereas unlined 835 square feet of radiation would have been required. The saving was 31.2 per cent.

L. H. Lockwood, Little Neck, Long Island, covered his old asbestos shingled roof with Housline, a cattle hair, protected insulation, in ¼-inch layers, manufactured by Johns-Manville, Inc. A new asbestos shingle roof was then laid directly upon the Housline. Instead of 8 tons of hard coal, burned the previous winter, 6 tons only were needed after the insulation was laid.

Typical instances similar to the foregoing can be furnished by practically all manufacturers of insulation. For the heating expert of the gas appliance dealer—and no selling organization can longer afford to be without such a man—a few typical examples of economy of insulation and a good collection of photographs represent strong selling data and may well be carried as part of the regular kit. Combined with these data, nevertheless, the salesman should know the underlying principles of heating and the importance of loss by transmission through materials of construction.

How Heat Loss Occurs

The natural tendency of two different temperatures is to equalize by an interchange of heat, heat flowing, in general, from the higher to the lower temperature. The flow takes place in varying degrees through all materials, being almost unimpeded in metals, rapid in concrete, brick, tile and stone, somewhat slower in wood and so on down the line to the better kinds of insulation. Relatively, the materials of which walls and roofs are constructed are heat conductors and permit loss of heat readily. Slate, for example, permits transmissionn of 10.37 heat units per square foot per hour per degree of difference in temperature between outer and inner surfaces. Concrete permits loss of 3.2 to 4.7 units, wood (average) 1.02, and the better grades of prepared insulation from 0.246 to 0.400 units.

Fig. 2—Nailing Armstrong Corkboard to Wall Studs

Heat flow varies inversely as the thickness of the material; that is, about twice as much heat will pass in a given time through four inches of concrete as through eight inches of the same material. Roof

loss in average construction is great, due to its exposed position. Heat rises to the highest point in a building and, collecting under the roof, escapes to the outer air more rapidly than through walls. The following example illustrates the possible reduction in heat transmission secured by the addition of a 2-inch layer of corkboard to the regular roof deck construction:

Transmission through 4 inches of concrete covered with standard roofing per square foot per hour for 70 degrees difference between outside and inside air =24.64 B.t.u.

Transmission for the same construction, with 2 inches of corkboard added=7.43 B.t.u.

Cork Reduced Heat Flow Seventy Per Cent

In brief, the addition of 2 inches of cork reduced the heat flow through the roof approximately 70 per cent. The effect may be demonstrated further by taking a typical building and calculating the fuel saved by insulation. Assume a three-story house in Pennsylvania having 14,000 square feet of roof deck of 4-inch concrete, covered with standard roofing. It is desired to heat from zero to 70 degrees Fahr.

The total heat transmitted through the roof in B.t.u. equals the area, times the temperature difference, times the factor of transmission. The factor is in this case 0.35, and the equation is therefore:, 14,000 x (70—0) x 0.13=343,000 B.t.u. per hour.

Now, if the same roof were to have a single layer of some good insulating material, say, like corkboard, 1½ inches thick, the transmission factor would be 0.13 and the heat loss:

14,000 x (70—0) x 0.13=127,400 B.t.u. per hour.

The saving due to insulation is 215,600 B.t.u. per hour.

The calculation necessary to translate the saving into terms of hard coal, having a thermal value of 14,000 B.t.u. per pound, when the efficiency of the heating system is 60 per cent, over a heating season of 210 days and an average outside temperature of 40 degrees, would be:

$$\frac{343(\text{B.t.u.}) \times 24(\text{hr.}) \times 210 \times 100(\%) \times 70—40(\text{deg. dif.})}{14{,}000(\text{B.t.u.}) \times 2{,}000(\text{lb.}) \times 60(\%) \times 70—0(\text{deg. dif.})} = 40 \text{ tons}$$

This is the amount of fuel necessary to offset the heat lost by transmission through the roof.

A similar calculation, substituting 127,400 B.t.u. for 343,000 B.t.u., shows the loss through the roof, if insulated, to be only 16 tons, representing a saving of 28 tons, or about 64 per cent. It should be mentioned that the efficiency of a coal-fired heater at 60 per cent is high and rarely obtained in practice at the end of one season's use, whereas gas fueled heaters often reach an efficiency of 85 per cent.

Fig. 3—Laying Armstrong's Corkboard on Roof

Saving in Cost of Heating Plant

A corresponding saving in radiation may be made in the heating plant for an insulated building and this can usually be installed one size smaller than in an uninsulated building. Similar economy is possible when walls and floors, especially first and top, are insulated. In general, the reduction in the heating plant capacity is a first cost saving that will pay about 60 per cent of the gross cost of the insulation, leaving its net cost only about two or three per cent of the value of the completed building.

A comparison of several of the best known insulating materials is of interest and the accompanying table of conductivity is expressed in B.t.u. per hour per square foot per degree difference in inner and outer temperature per inch thick.

Table of Thermal Conductivity of Insulating Materials

Material	Conductivity
Air	0.175
Pure wool	0.246
Hair felt	0.246
Slag wool (loosely packed)	0.262
Mineral wool (loosely packed)	0.271
Corkboard	0.271
Ground cork (less than 1/16 in.)	0.295
Cabots Quilt	0.321
Flaxlinum	0.329
Celotex	0.329
Insulex (low density)	0.400
Sawdust	0.404
Planer shavings	0.416
Air cell asbestos (1 in.)	0.500
Asbestos paper	0.500
Wall board	0.500
85% Magnesia	0.500
Gypsum plaster	2.330

A fact which cannot be overlooked is that a properly insulated building, besides being easier to heat is a cooler one in summer. It is also vermin and sound proof and, to a large extent, fireproof. In certain classes of industrial buildings, as, for example, silk and textile dyehouses, an inch or more of insulation will prevent deposit of condensation which

often drips on to finished products making redyeing necessary. Humidification and dehumidification are accomplished much more easily and with economy in equipment.

Although the heating salesman is not required to sell and install insulation its increased use promises to have a marked influence on heating practice and calculations of heating systems, and prediction has been made that few buildings will be erected in the future without insulation.

"A Message from the A. G. A."*

Alexander Forward

Managing Director, American Gas Association.

I FAVOR a very large degree of rotation in public appearance before any one organization, and, although it is complimentary to be asked again by your Executive Committee to address you, I promise to make this ordeal brief.

Our President, Mr. Macbeth, has sent you his greetings from Los Angeles. I know how he regrets his inability to address you and to deliver this message from the American Gas Association in person.

The men who conceived and launched the Eastern States Gas Conference, most of whom are here present, builded better than they knew. The Conference has become the rallying point for the men and women in all the branches of the gas industry in the states within its boundaries. It affords a mid-year convention under the best possible auspices; it widens the sphere of the State Associations and, happily, includes nearby companies not organized within state lines.

It is a truism that the only light to guide the footsteps of mankind on the journey of life is the lamp of experience, and it is equally true, and especially if we may believe current writers with regard to the younger generation of our time, that we are seldom willing to learn very much from the experience of others but have to try everything out for ourselves. It is very good, therefore, to pause now and then, as perhaps some of us do at New Year's or on birthdays (those of us who still observe or like to think of that event), and review what has happened in the interval since we passed the last preceding milestone.

Position of Conference Assured

One year ago, in addressing you, I expressed the opinion that the place which the gas men and women of the Eastern States occupy in the sun is due to your leadership and to the spirit of the individual members of the Conference, and that as a result of these things your position in the industry is most thoroughly assured. I have nothing to add to that sentiment. It is just as true now as it was a year ago and is even more thoroughly confirmed.

One of the many things I like about the gas industry is the growing spirit of curiosity and adventure. So many people and so many industries lack it. O. Henry was wont to poke fun at the provincialism of New York, and I have no doubt that there is as much there today as when he wrote it. In one place he told of the citizen who had run a cigar store on Beekman Street for thirty years and about once a year got as far north as Madison Square, and that never in his life had been west of Eighth Avenue. It was said that a brother of his died on Ninth Avenue, but that was too far west for this individual, and he met the funeral procession at Eighth Avenue. O. Henry's typical Bowery rounder was said to have never been above Fourteenth Street. In Richmond, Va., it was said, and generally believed, of a friend of mine, a telegraph operator, that he was never known to go north, east, west or south of an area one-half mile long and three blocks wide. I know a merchant, also in Richmond, who has not in twenty years been anywhere except in his store, his home and his church. What these people miss in lack of contact with the world outside is reflected in the lack of success they might otherwise have attained in their business, and in the case of New York is exemplified in the inability of many residents of that city to realize that there is a substantial part of the country on the other side of the Hudson River.

One thing we get when we look outside is a viewpoint of what our associates are doing in the same line of human endeavor.

Figures Demonstrate Growth of Gas Industry

Figures are always important, whether on a statistical sheet or in modern garb, and in some instances we like to see growing and enlarged figures and in other cases we prefer them the opposite. It is a matter of individual taste, one might say. The gas industry's figure is such that it requires larger clothing each year, and we do not propose to diet. While it is very important to us to know that our sales for 1926 amounted to 459,326,000,000 cubic feet, an increase of 38,000,000,000 cubic feet over 1925, and of 132,000,000,000 cubic feet, or 40 per cent, in five years, it is much more important to know that we, as an industry, realize our responsibilities to the public we serve, measure our opportunities and pre-

*Address delivered at the Fifth Annual Meeting of Eastern States Gas Conference, Philadelphia, April 7th and 8th, 1927.

pare to occupy the vital position which we shall necessarily have in the future of our civilization.

While it is important that we know that the increase in 1926 sales over 1925 is more than twice the increase in 1925 over 1924, and is almost as large as the combined increases in 1921 and 1922, it is more important to know that we are looking forward to the time when our increases will be in a very much larger proportion.

It is interesting and essential to us to realize that we added 400,000 new customers, or 4 per cent increase, to our lines in 1926, bringing the total to 11,000,000. It is more vital to know that the industry is awake and alert in the service of those 11,000,000 American men, women and children, and that it is bending its efforts to make possible the extension of the service in economy of production, in conservation of natural resources, in producing the most efficient and most healthful form of heat, and in adding to the comforts and conveniences in the homes of America.

Gas Appliance Testing Laboratory Doing Notable Work

One year ago I talked about the work of the Gas Appliance Testing Laboratory at Cleveland. That institution, founded and maintained by the American Gas Association, is designed for the sole purpose of improving the efficiency and safety of gas-burning appliances in the home. It is now firmly established and is doing notable work. The laboratory is receiving whole-hearted support from the Natural Gas Association of America, the United States Bureaus of Mines and Standards and the Public Health Service, all of which are co-operating to the fullest extent in its endeavors. Nearly all manufacturers of gas ranges and of space heaters who are members of the association have submitted their models for test and have received approvals, while a very large percentage of range manufacturers now make and sell nothing but laboratory approved appliances. We are just beginning to test water heaters, and within a month or two we shall begin to test central house heating appliances. Secretary Hoover commended it at our last convention as one of the outstanding efforts of American industry. One of the most gratifying features in our laboratory work has been the thorough co-operation and support given us by manufacturers of appliances.

One year ago I referred to the creation by the Association of a fund for research in industrial gas utilization. That research is now well launched upon its five-year program through various agencies. Our gas companies are doing for our industry what the manufacturers have done for the electrical industry. We are broadening our outlook.

Gas Industry Aids in Home Making

We are much pleased to have the opportunity to take part in the Better Equipped Homes Campaign of the General Federation of Women's Clubs, which will be discussed this morning by Mrs. Sherman, president of that organization. We hear much in these days about the abandonment of the home for the roadhouse and the restaurant and the filling station. Mr. Rudyard Kipling is of the opinion that except for the words with which man expresses his thoughts, the appliances he makes and the rate of speed at which he propels himself and his possessions through space, nothing ever changes from age to age. Unless human nature can change all at once, I venture the opinion that the women of America are not going to abandon the sphere of their abode, their one best bet, the home. On the contrary, as they have always done, they will fight to keep what they have and still be glad to join in any reasonable effort to make the home a better place in which to stay.

The General Federation of Women's Clubs is engaged in a notable work with local organizations to relieve drudgery and to increase the use of appliances which bring comfort, convenience and happiness to the homes of America.

We are very far from saturation in any branch of our business; the surveys of the General Federation of Women's Clubs prove this. Not even in use of gas ranges have we reached the limit of our opportunities. We are very far from such a limit in water heating, notwithstanding its essentiality in any home today. Large opportunities are before us to transform many unprofitable customers to profitable ones by the addition of refrigeration by gas and of incineration by gas. When one stops to stick a pin at this point and see where we were one year ago, it is easy to see that we have made progress.

Homes and Business Buildings Will Eventually Be Gas Heated

The homes and business buildings of America will eventually be heated with gas. We are making great strides. In New England many companies are finding it difficult to supply the demand for installation and a survey made by the New England Committee on Public Utility Information of the amount of this business in that section was out of date sixty days after it was completed. The northern Middle West is thoroughly awake on this subject. Each installation advertises itself and creates the demand for more. Gas house heating is becoming a necessary luxury in American life and before long it will, like the telephone and the electric lamp, become a necessity without being regarded as a luxury. It is quite true, however, that in those sections of the country where the demand is for only a few days in the winter, it is not economically sound so far as can now be seen for a gas company to incur the very large standby expenses necessary to serve a demand of from one to ten days in a year.

Before long it will be a matter of law. Once public sentiment is thoroughly aroused to the annual cost in lives and health and money due to smoke in our cities, the demand will become irresistible for prohibition of the burning of raw fuel by anyone except in the gas and electric plants.

The Smoke Evil

During the hard coal strike of 1926 I have seen the streets of New York darker at 8 and 9 o'clock in the morning than at any time in the night, due to smoke, and, of course, of the absence at that hour of street lighting. Early last year, when the Engineers' Club of New York paid a considerable sum to have its face washed, I believe $1,200, an officer of the club directed my attention to the beautiful stone of which the front is built. He recommended that I take a good look at it, since I would probably never see it again. He was correct; I have never seen that face since, although I go there several times a week. It is covered with sooty deposit. This is true notwithstanding the fact that New York is one of the cleanest of America's cities with reasonably successful enforcement of a smoke prevention ordinance. It is no wonder that gas fired house heating appliances have increased their sales more than 2,000 per cent since 1919. Insulation of homes is doing a great deal towards overcoming the natural resistance caused by the larger cost of using gas as compared with coal. But, regardless of the matter of cost, as soon as the American people find out what it means to have automatic, controllable, troubleless heat and no arguments about who should fix the furnace, they will have it. Varying in localities, the difference in the laundry bill alone is from $25 to $150 per year for the average family between a smoky city and a smokeless one. In one city, recorded by Mr. Floyd Parsons in his very fine statistics on this subject, containing 900,000 people, the cost of household washing was increased approximately $1,200,000 annually by smoking chimneys.

Our national, state and city authorities have gone on record as to the dangers and expense and the effect upon public health of the smoke nuisance, and the statements of such men as Secretary Hoover, Dr. Harris of New York City, O. P. Hood of the U. S. Bureau of Mines, Floyd W. Parsons and other well-known authorities are in complete agreement on this subject. Quite recently Dr. William Charles White, a pathologist of the United States Public Health Service, linked smoke and pneumonia, and Dr. Harris said there was much evidence to support Dr. White's contention. Mr. C. E. Davies, managing editor of Mechanical Engineering, has recently said: "Elimination of smoke is a matter of constant police search rather than just a temporary activity on the part of municipal authorities." Mr. Davies advocated constant care on the part of those operating the equipment to prevent excessive smoke discharge. The National Conference Board on Sanitation has also gone on record as to the values of sun rays and described the five delicate machines for the photo-electric measurement of light placed in five strategic places in New York with the aid of Dr. Ives, physicist of the United States Public Health Service.

The gas industry cannot, however, afford to wait the slow growth of public sentiment. We must go out after this business, be careful of our installation, service them diligently, talk them and advertise them.

All-Gas Home to Be Stressed

In this year much has elapsed. The gas industry is coming to a full realization of the importance of stressing the all-gas equipped home rather than the sale of individual appliances. The unit home adequately piped and vented, with the comforts of gas cooking, water heating, house heating, refrigeration, incineration and laundry appliances, appeal to the hard sense as well as the imagination of the home builder and the home maker. Blue Star homes, the modern standard of comfort and convenience, and indeed of necessity, now dot the country, and each is a unit in helping to advertise what we have to sell to our public. With a full line of laboratory approved appliances, testifying to efficiency and safety, in the months and years to come it will be increasingly easier to convince builders and home makers that the modern home must be equal to the standards of the Blue Star plan.

We are looking outside more every day. All of you have seen the American Gas Association's program of activities for a three and five year period as adopted one year ago on the report of the committee headed by Past President Cortelyou. All of our activities are based on that report and it well illustrates what I have been talking about.

One of the many striking phrases in Lawrence's new book, "Revolt in the Desert," is that "honor is never to be gained by assured success."

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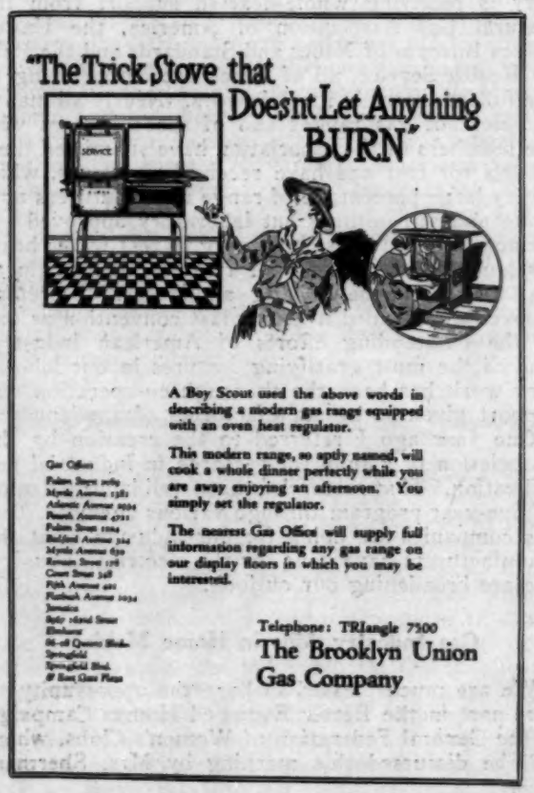

"The Trick Stove that Doesn't Let Anything BURN"
A Boy Scout used the above words in describing a modern gas range equipped with an oven heat regulator.
This modern range, so aptly named, will cook a whole dinner perfectly while you are away enjoying an afternoon. You simply set the regulator.
The nearest Gas Office will supply full information regarding any gas range on our display floors in which you may be interested.
Telephone: TRIangle 7500
The Brooklyn Union Gas Company

Factors and Influences That Promote the Sales of Gas for Heating*

G. C. Carnahan

The Peoples Gas Light and Coke Company, Chicago, Illinois

HEATING homes with gas in Chicago has been actively promoted since October, 1923. As a result of three and one-half years of active campaigning, 1,600 Chicago homes are being heated by gas during the winter of 1926 and '27. It is realized that such a number is a very small percentage of the total possibilities and, as yet, no very definite conclusions can be drawn. However, certain definite facts regarding selling and servicing gas-fired central heating plants seem to be formulating.

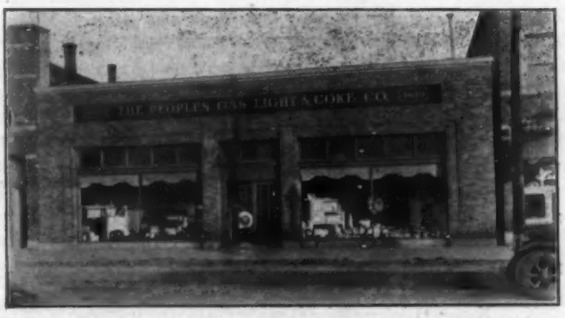
No attempt to cover all angles of the selling and servicing problem will be made at this time, as it is felt that perhaps the outstanding aspects of our experience with gas house heating would prove more interesting. In dealing with the selling and servicing problems, certain definite factors seem to grow more important each year. They are these, which are apparently most important, that are to be discussed.

Selling Gas for Heating to the Public

In selling gas for heating, apparently there are three main problems to be solved. First, in acquainting the public with the fact that manufactured gas is being used for home heating; second, to establish the fact that the cost of heating a home with manufactured gas is as low as it is; and third, to stimulate each slightly interested customer to the point where he will make the outlay of money for the necessary equipment and conclude to pay the increase in heating cost of gas over his present fuel.

The first and second aspects of the selling problem seem to be largely a matter of advertising and of canvassing the field of possible prospects. Advertising alone does not seem to register for gas heating in the degree that advertising organizations would lead us to believe. Perhaps too much is expected in such a new and revolutionary advancement in the art of home heating as the use of manufactured gas presents. At least two boiler manufacturers are helping gas companies establish manufactured gas as a home heating fuel in the minds of the public. Our company has advertised consistently in local newspapers for over three years. In spite of this, it seems that the attention of the majority of our prospects must be secured by personal canvass. We are making progress, but it must be admitted that gas has just begun to secure public attention as a home heating fuel. This fact is encouraging because such public realization as we have been able to effect has been decidedly favorable.

Perhaps the reason that the general idea of heating by gas does not register as strongly, through advertising, as might be anticipated, is because the general impression exists that the cost of home heating with manufactured gas is prohibitive. The most effective advertising by our company concentrated on the subject of cost. Advertisements showing the detailed cost per season of common types of homes, brought the most productive class of inquiries. This class of publicity has been effectively supplemented by bill boards and by pamphlets in which the predominating theme is operating costs. Slowly but surely the erroneous prevalent opinion regarding the cost of gas heating is being corrected. Enthusiastic publicity afforded by our increasing numbers of users can be credited for much of this progress.



Neighborhood Store Job

Securing contracts for the necessary equipment and subsequent sales of gas can only be accomplished with an adequate sales force. Personal canvass is now, and will be for some time to come, the keynote of a sales campaign. That the sales force must be especially trained in the knowledge of gas and in heating practices generally is an established fact. We have found that one or two years are required to round out the usefulness of our heating salesmen, chiefly because it takes about that long for them to acquire a working knowledge of general heating practices. The day has not yet arrived when our customers are deciding to heat with gas without first having contact with a competent field salesman, although a few exceptions are beginning to occur. Here, again, we can trace this encouraging new aspect to our satisfied users who influence their friends and acquaintances even more favorably than the best salesman.

One of the most important parts of a salesman's knowledge is ability to accurately estimate the rate of heat loss from a building. This estimate is the basis of sizing the appliance and estimating the cost

* Presented before the Joint Convention of Illinois Gas Association (23rd Annual Meeting), Illinois State Electric Association (26th Annual Meeting), and Illinois Electric Railways Association (18th Annual Meeting), March 17 and 18, 1927, at Springfield, Ill.

of the season's fuel. Reasonable variations may be compensated for in radiation and boiler sizes, but to be inaccurate in the estimated cost per season either increases the sales resistance unnecessarily by having the estimated cost too high, or eventually results in a dissatisfied customer by placing the estimate lower than the actual cost.

Rule of thumb methods used in figuring heat losses will not serve in our business. Thickness of walls and character of materials used must be taken into consideration. Many good hand books, including the new House Heating Book published by the A. G. A., give suitable co-efficients on standard construction. Most insulating companies now publish figures for their particular product used with standard construction, but many combinations are encountered that are not found in the available tables and every salesman should know how to calculate the proper factor.

The following method is now generally used by our men with good results.

Calculations of Co-efficients of Heat Transmission

The co-efficient of heat transmission for any wall may be calculated by the use of the formula given by Harding and Willard.

$$u = \frac{1}{\frac{1}{K_1} + \frac{X_1}{C_1} + \frac{1}{K_2} + \frac{1}{K_3} + \frac{X_2}{C_2}}$$

Let u = the heat transmission factor for the complete wall per square foot per hour per degree difference in temperature between the inside and outside air temperature.

K_1, K_3 = the combined co-efficient for radiation and convection co-efficients for the inside surfaces.

K_2, K_4 = same as K_1, but for other surfaces.

X_1, X_2 = thickness of materials in inches.

C_1, C_2 = heat transmitted through materials by conduction.

This formula is quite complete and where the proper figures for the various factors are available the co-efficients for any kind of a wall can be calculated.

Simplified Formula

The above formula, while it is very complete and accurate in the form shown, can be simplified to a certain extent. For example: In the above formula the co-efficients of conductivity are converted to resistances, mathematically in order to add the co-efficients for the various parts of a wall. The steps may be calculated one at a time if desired.

Similarly, we can calculate the new co-efficient resulting from the application of an insulating material to an ordinary wall. For this purpose we convert the transmission or conductivity co-efficients to resistances by the formula.

$$R = \frac{1}{f}$$

In this formula we let

R = resistance of a wall or part of a wall to the passage of heat.

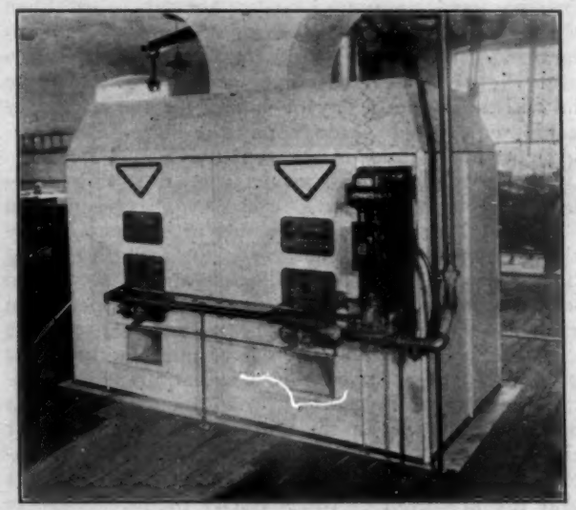
f = factor for the conductivity or transmission of heat through the wall or part of the wall.

The next step is to add the resistances together and then convert the total resistance to a conductivity or transmission factor for the complete wall.

$$F = \frac{1}{R_1 + R_2 + \text{etc.}} = \text{factor for complete insulated wall.}$$

Suppose, for example, we wish to calculate the new transmission factor resulting from the application of 1 inch of Flaxlinum to a wall composed of clapboard, paper, sheathing, studs, lath and plaster. The transmission factor for the uninsulated wall we find from data books is 0.30 B.t.u. per square foot per hour per degree difference between the inside and the outside of the wall. The factor for Flaxlinum is given as 0.33 for 1 inch thickness.

The resistance factor of the wall is 1 divided by 0.30 or 0.33. The resistance factor for the Flaxlinum is 1 divided by 0.33 or 3.03. The total resistance for the insulated wall is 3.33 plus 3.03 or 6.36. The transmission factor for the insulated wall then becomes 1 divided by 6.36 or 0.16 B.t.u. per square foot, per hour, per degree difference in temperature. The factor for this insulated wall for 70° temperature difference then becomes $70 \times 0.16 = 11.20$ B.t.u. per square foot per hour.



Warm Air Installation in a Factory

Calculation of Combined Factor for Ceiling and Roof

The usual method for calculating heat losses through a ceiling and a roof is to assume an attic temperature of 30° or 40° and then to use the appropriate factor for the ceiling or the roof. This method is accurate only if the assumed attic temperature happens to be correct. A more accurate method and

a method which is quite necessary where insulation has been applied, is to use a combined factor for the ceiling and roof. This combined factor is obtained in a manner similar to that used in figuring an insulated wall.

Suppose, for example, that we wish to figure the hourly heat losses for a residence having an unfloored attic and a roof composed of wood shingles on tight sheathing. The factor for a lath and a plaster ceiling with no floor above is 0.50 and the factor for a shingled roof is 0.32 B.t.u. per hour per square foot, per degree difference in temperature. The area of the ordinary pitched roof and gables is about 50% greater than the ceiling beneath it.

In order to allow for the extra area of the roof, add 50%, or the exact calculated ratios of the roof and gable area compared to the ceiling area, to the transmission factor for the roof before combining this factor with the ceiling factor. Then apply the combined factor to the area of the ceiling.

For example: The factor for the roof construction is 0.32. Adding 50% to it or 0.16 equals 0.48 as the roof factor to be applied to the ceiling area. To convert this factor to resistance, divide 1 by 0.48, which equals 2.08. This is resistance factor for the roof. The resistance factor for the ceiling becomes 1 divided by 0.50 or 2.00. The total resistance of the roof and ceiling per square foot of ceiling is 2.08 plus 2.00 or 4.08. The conduction factor for the combined roof and ceiling is 1 divided by 4.08 or 0.25 B.t.u. per square foot per hour of ceiling area, per degree difference in temperature between the air under the ceiling and the outside air. For a temperature difference of 70° between the inside and outside, this factor becomes 70 x 0.25 or 17.5 B.t.u. per square foot of ceiling area per hour.

Calculation of Factor for Insulation in the Attic

In buildings where insulation is applied in the attic floor or under the roof, a combined factor can be calculated in a manner similar as shown above.

If 4 inches of Insulex has been poured between the floor joists of the attic, the resulting transmission factor would be calculated as follows:

The transmission factor for Insulex is approximately 0.40 B.t.u. per inch of thickness. The resistance for one inch thickness would be 1 divided by 0.40 or 2.5. The resistance for 4 inches of Insulex would be 4 times 2.5 or 10.0 per square foot. The resistance of the roof per square foot of ceiling area was shown above to be 2.08. The resistance for the ceiling was shown to be 2.00 per square foot. The total resistance for the insulation, ceiling, and roof per square foot of ceiling area is 10.0 plus 2.08 plus 2.00 or 14.08. The combined transmission factor per square foot of ceiling area per hour per degree difference in temperature for the insulation, ceiling and roof is 1 divided by 14.08 or .071 B.t.u. For a 70° difference in temperature this factor becomes 70 times .071 or 4.97 B.t.u. per square foot per hour.

When the insulating material is applied to the roof and gables, the combined factor is obtained as shown above except that the area of the insulating material is the same as the roof and gable area, and allowance must be made for this fact in the calculations.

For example: Suppose we have 2 inches of corkboard applied under a roof of wood shingles on tight sheathing and to gables of the same construction and that the attic has a 1 inch floor.

The heat transmission factor for a square foot of shingled roof is 0.32. Adding 50% to allow for the extra area of the roof and gables in comparison to the area of the ceiling, this becomes 0.48. The resistance of roof and gable per square foot of ceiling area is then 1 divided by 0.48 which equals 2.08. The transmission factor for corkboard per square foot per inch thickness per hour per degree difference in temperature is given as 0.30 B.t.u. Adding 50% to this for the same reason it was added to the roof factor this becomes 0.45 per inch of thickness. The resistance, therefore, is 1 divided by 0.45 or 2.22 per inch thick. Two inches of corkboard will have a resistance of 2 times 2.22 or 4.44 per square foot of ceiling area. The transmission factor for a lath and plaster ceiling with a single floor above is given as 0.28 B.t.u. per square foot. The resistance, therefore, is 1 divided by 0.28 or 3.57.

The total resistance for the insulated roof and floored attic is 2.08 plus 4.44 plus 3.57 or 10.09. The transmission factor corresponding to this resistance is 1 divided by 10.09 or 0.099, which is the B.t.u. transmitted per hour per degree difference in temperature between the air under the ceiling and the air out of doors per square foot of ceiling area. For 70° this transmission factor becomes 70 times 0.099 or 6.93 B.t.u. per square foot of ceiling area per hour.

Influence of the Architect and Heating Contractor

The measure of success to be attained in selling gas for house heating will depend largely on the support secured through the architect and heating contractor. Selling resistance to gas heating is decidedly less in new homes than old. If the gas fired central heating plant is installed at the time the building is erected, little extra expense is necessary in order to use gas, and it is only necessary for the salesman to convince the owner and his architect that gas is desirable.

The heating contractor who installs the plant has a very decided influence in the owner's final decision, and it is necessary therefore, that they be furnished the facts, as well as the owner and architect.

Decided progress has been made with both the architects and heating contractors in Chicago. Several architects are now recommending gas heating to their clients and specifying it in certain classes of homes where they feel it is most suitable. This is being done, in some cases, without solicitation on our part and has resulted from the contact these architects have had with previous gas installations that have been highly satisfactory to their clients.

Heating contractors have shown an unusual response to gas heating. Thirteen heating contractors are either displaying gas-fired equipment, or using

gas heat in their place of business. Eight more are heating their homes with gas. The United Association of Journeymen Plumbers and Steam Fitters of the United States and Canada use a gas-fired central heating plant in their headquarters. This installation has given gas heating an unusual amount of publicity with the heating fraternity.

It is felt that the splendid progress made with the heating contractors in Chicago has resulted from our early policy of co-operating with them. All of our installations have been made by them. On installations in new homes we have acted in the capacity of a jobber in supplying the gas boilers.

All servicing of gas-fired equipment, after once properly installed, has been handled by our company, and heating contractors have been relieved of the responsibility and expense of any subsequent adjustments. Personal instruction on the erection of the boilers and the proper connections of the gas piping is supplied free of charge by our company to the fitters actually doing the work.

Co-operation with the heating contractors and the solicitation of the architects have already produced encouraging results. Fifty per cent of our 1926 sales were made through these channels.

Influence of Special Gas Rates for Heating

A special heating rate seems to be desirable, if not almost essential in the selling of gas to home owners. Most prospects feel that this relatively large use of gas entitles them to some price concession. Most every one is accustomed to wholesale rates being applied to quantity purchases, and it is only logical many prospects feel that they are buying gas in wholesale quantities when they begin heating their homes with it.

Importance of Selecting and Developing Suitable Equipment

Permanent and continued progress in the sale of gas for heating can be definitely assured only if the proper equipment is used. It would seem that the gas-fired heating appliances offered today are fairly well developed and the necessary controls, which are more important from the standpoint of the satisfaction to be secured by the customer than the thermal efficiency of the appliance, are in such stage of development that their continued satisfactory performance is assured.

Fortunately the room temperature control had been developed and perfected in connection with coal burning appliances before gas heating got under way. In the last three years water temperature and steam pressure controls for gas boilers have been improved, and the low water fuel cut-off, the water feed, and the safety pilot control have all been developed in the face of urgent necessity. At the present time, the gas-fired central heating systems that are being sold and installed are equipped with all the accessories necessary for the highest grade of service.

Our experience has led to more careful consideration being given to flue connections and chimneys. The material used in the vent connection between the boiler outlet and the chimney is of better quality than heretofore. Russia iron flue pipe is no longer tolerated. Galvanized flue pipe has also been found to be unsuitable. During the last year, we have used either Terne-plate or Ascoloy. These are the only two materials we have found suitable. Flue pipe is now cemented to the inside of the chimney at the liner, as well as at the outside wall. When a chimney is encountered that is in a bad state of repair a liner of the same material used for the vent pipe is extended inside the chimney to the top above the roof.

Chimneys that are affected with down draft, due to their relative height in relation to the high point of the roof or to an adjacent building, must be extended or equipped with a chimney top that will prevent down draft. Adequate draft is absolutely essential and the down draft diverter at the boiler is to be depended upon only to equalize the draft in the boiler, and as a safeguard against an occasional blocked chimney, but should never be considered an adequate cure for a consistent down draft.

New Developments in the Art of Heating That Help Gas Sales

Many new developments within the heating industry have been noteworthy. Some of these have improved operating conditions which indirectly improved gas heating. In other cases, these new developments have opened up a new application for gas heating.

Vacuum systems and vapor heating specialties have done much to remove the objection to the intermittent firing of gas boilers by keeping heat in steam radiation long after the fire has been turned off in the boiler, as well as obviating the necessity of expelling air from the radiation at the beginning of each firing period. Quick venting valves on the radiators and returns are absolutely essential in a steam system operating with a gas-fired boiler.

Pressure or closed water radiation systems are desirable when gas-fired systems, as intermittent heating seems to require more frequent filling if an open expansion tank is employed. Shortage in radiation can be compensated for by converting an open water system to a pressure system by reason of the fact that water radiation when under pressure can be heated to steam temperatures without danger.

Unit heaters and heat cabinets are some of the recent developments in the heating field. Unit heaters open up the factory and garage heating field in more satisfactory manner than heretofore from a gas standpoint. Unit heaters also make it possible to use gas steam boilers in heating stores without basements and without using boiler pits or overhead water systems, both of which had their objectionable features in this class of heating.

Concealed radiation, while not affecting gas heating directly, is a new development and should be thoroughly familiar to gas heating salesmen. If artificial cooling of homes is to be linked with heating,

it seems quite probable that this form of radiation may play an important part.

Insulation

Insulation is among the recent developments in better building construction. Among recent developments, this one seems to hold more promise as a real stimulant toward more gas heated homes than any.

Of all the heat losses that occur from the ordinary home, only the heat carried away by air changes is absolutely essential. The other losses, while not entirely preventable, are not necessary.

It may also be said that in many cases the air change is far in excess of the necessary amount for healthful living conditions.

Much thought has been given to reducing the unnecessary heat losses from buildings, and new heat resisting materials and constructions, among which is insulation, have been developed, to be used as additions to the ordinary construction, or to replace other material having less resistance to heat passage. Storm sash and weather strips also reduce heat losses at windows and doors.

Recent experiments and tests have established beyond a doubt that where proper consideration and provision are made at time buildings are erected, heating cost may be reduced easily 50% over those experienced with ordinary construction. These same improvements can be applied to homes already built, but not as completely as is possible in new construction. Savings amounting to between 10% and 20% have been effected where insulation and storm sash or weather strip have been applied.

It behooves the gas man who is selling his product for heating homes to be thoroughly familiar with these various materials that will reduce unnecessary heat losses, and to preach the doctrine of better construction in home building. Proper construction makes it possible for owners to heat their homes as cheaply with gas at prevailing prices as it would have cost with less expensive fuels generally used in homes of ordinary construction. Such a program removes the most prevalent objection to gas heating in new buildings which is the increased operating cost over other commonly used fuels. The cost of heat proofing a house is probably only 5% to 10% of the total cost.

Service to Heating Customers

This department of an organization selling gas for heating homes must be equally efficient as the one whose business it is to sell the idea and the necessary appliances. Continuous satisfactory service should be experienced by every customer, and to make this a reality there must be a prompt response to every request for service whether or not the cause is trivial or urgent.

Customer's service consists of two distinct divisions—first is mechanical service required on the heating system. This involves not only the actual gas boiler or furnace itself, but all other portions of the entire heating system. We have found it necessary to provide our service men with a working knowledge of all the heating accessories that are in use, as the failure of any part of a heating system is generally referred to the gas company once the customer begins using gas as a fuel.

It has been our practice to provide one annual cleaning and inspection. At this time the gas heating appliance is thoroughly overhauled. Any new parts required, such as flue pipe, are renewed at this time. This work is generally done during the summer months which helps to keep the service men busy during this period, and also obviates the necessity of shutting off the heating plant during the heating season. We are now beginning to get some idea of the extent of mechanical service required on gas-fired central heating systems. During the year 1926 the average number of service calls for all reasons averaged five per heating customer. This figure included the annual inspection, and the turning on of about 50% of the plants in the fall, and turning off about a like amount in the spring. This leaves an average of about three calls per season per plant for all other reasons, which includes the adjustment and the first inspection on all new installations. It also includes the calls made by the service men to instruct heating contractors on the erection and installation of the appliances. First year installations require more servicing than those in operation more than a year, due to the first adjustments and the necessity of instructing the owners in the various phases of the plant operation. The figures indicate that the old installations require an average of about one service call per year in addition to the annual inspection.

Our maximum day on servicing in 1926 was 75 calls. This occurred during the last of September, at the beginning of the first cold spell. The calls were largely to put new installations in operation and to increase the water temperatures and steam pressures on other new installations.

These figures as given are to be taken only as an indication of what the servicing amounts to and we expect them to grow less as the number of installations increase and as the knowledge of our service men is broadened through longer experience. At the present time we are working on the schedule of one service man to 100 installations, which seems to be adequate.

The service calls by months are shown below:

January	8.7%	July	5.7%
February	8.5%	August	4.5%
March	9.9%	September	10.4%
April	8.3%	October	16.5%
May	6.0%	November	12.4%
June	4.4%	December	4.7%

The other kind of service required from heating customers (especially first year users) is in reassuring them regarding the amounts of their first few bills, and in checking against the season's estimate to see that the current bills are in proper proportion

to the severity of the weather during the time covered by each bill. A comprehensive method is indispensable in discussing heating bills with customers, or comparing the bills for the same period during successive seasons, as well as in arriving at the approximate savings effected by various improvements in the home, such as storm windows, insulation or weather stripping. Unless such comparisons take into consideration the exact temperatures they are of little value and may be misleading.

By reason of the fact that we consider such a method of comparison indispensable in our business, the method and its derivation is given here in detail with the hope that others may find it useful.

The Normal Heating Season for Chicago

A home usually retains enough heat to be comfortable when the outside temperature averages 60 degrees Fahrenheit for the day. Heating plants in homes are rarely put in operation when the daily average temperature is 60° or higher. The records of the United States Weather Bureau shows that the daily average temperature for Chicago is normally below 60° from October 4th until May 21st. The normal or average heating season for Chicago is, therefore, a period of 230 days. The average temperature for this period is 38.0° Fahrenheit.

Assume that the average home will be kept at 70° for sixteen hours of the day and at 55° for eight hours of the day, the total number of hours in a heating season during which the home will be kept at 70°, is 230×16 or 3,680 hours and the number of hours at 55° is 230×8 or 1,840.

The amount of heat required in a home is in proportion to the temperature difference between the inside and the outside of the home, as well as to the length of time this temperature difference exists. The term used in combining temperature difference and time when determining the heat requirements for a home is "Degree Hour." A "Degree Hour" is an hour during which the average outside temperature is one degree lower than the average inside temperature. An hour during which the average outside temperature is 50° and inside is 70° is, therefore, equivalent to twenty degree hours.

The difference between an inside temperature of 70° and the average outside temperature of 38° for the Chicago heating season is 32°. This average temperature difference for the eight hours of the night is between 55° and 38° and is 17°. The number of degree hours in a heating season is 149,040 $(3680 \times 32) + (1840 \times 17)$.

Calculation of Heat Requirements Per Season

The figure of 149,040 degree hours when multiplied by the hourly B.t.u. loss from a building per degree difference between inside and outside temperature will give the total heat loss per season. This is the amount of heat which must be replaced by artificial means in climatic conditions equal to Chicago.

(To be concluded April 30)

GAS SALES DIVISION OF NEW ENGLAND GAS ASSOCIATION HOLD APRIL MEETING

THE Gas Sales Division of the New England Gas Association held its April meeting Friday, April 8, at the City Club, Boston, Mass. As in the previous meeting held this year, a special musical feature was arranged. The feature at this meeting was the singing of the Glow-Coke Twins from the Fall River Gas Works, at Fall River, Mass. These two boys, in black face, entertained the two hundred members and guests of the association with songs and stories for fully one-half hour and at the last song the members were very reluctant to let the boys leave the stage. The team is made up of Carl Palmer and Irving Adams, from the mechanical department and the office of the Fall River company. This part of the meeting was arranged by W. K. Eavenson, sales manager at Fall River, and was very much appreciated by all.

In opening the meeting Governor Webber called attention to the Gas Course to be held at the Massachusetts Institute of Technology from June 12th to the 24th. Those who have not sent in their registration and who desire to attend the course still have time to enroll by getting in touch with some member of the committee.

Attention was also called to the New England Sales Conference which would be held some time in June. A New England Regional Sales Council has been appointed and details are now under way. It is planned to hold the conference in Connecticut and it is expected that definite arrangements will be made so that formal announcement can be made at the May meeting of the association.

Referring to the May meeting, Governor Webber stated that this would be the annual meeting and therefore it was necessary to appoint a nominating committee at this time. As in the past years, the past Governors have been the nominating committee, Governor Webber stated that he felt that the nominating would be in the hands of good men if the past Governors acted in that capacity for this year. Therefore it is expected that the past Governors will have an interesting report to make at the annual meeting of the division in May.

Criticism of Slogan

Jesse L. Johnson, reporting for the Slogan Committee appointed by the Governor, said that there had been considerable criticism regarding the present slogan of the gas industry—"If It's Done with Heat, You Can Do It Better with Gas." The first criticism is that the slogan is too long and the second objection is that the slogan is lacking in positiveness. Major Forward has asked that every person engaged in the gas industry give thought to adopting a new slogan. The committee invites every member of the Sales Division to send in a suggested slogan, and the committee is making plans to conduct a contest among the members of the division. Mr. Johnson urged that everyone give thought to this matter.

Mr. Johnson referred to the new Everyday Magazine. He stated that the second edition had already been published and the third number was now on the press. There has been considerable reaction to the issues. One gas company received over two hundred comments on the first issue and the morning Herald reprinted a column taken from the magazine. Mr. Johnson stated that it was desired to increase the circulation by about 25,000 copies. He urged the members present to go back to their gas companies and see if it would not be possible to send in a subscription.

Referring to the subject of this meeting, Governor Webber stated that Obtaining and Improving Good-Will of Customers was a very vital and important subject to the industry. If you stop to think of it, this subject of good-will is a real asset. Take the lawyer or the doctor. The good-will of his clientele is his greatest asset. He can sell his good-will if he finds it slipping, move elsewhere and start all over. Take the manufacturer: If he finds his goods are not selling in a certain community, he can move to another city and start manufacturing all over again. Now take a look at the gas companies. Our good-will is one of our greatest assets. If we make a mistake we cannot take our company and move elsewhere. We have got to stay right where we began. Therefore, good-will is one of the things we should give serious consideration to. Governor Webber stated that the American Gas Association has studied this subject of good-will under the accounting section. The association has had for a long time very successful committees who have handled this subject under the heading of Employee and Customer Relationship. Mr. Webber stated that although we have no accounting section of the New England Gas Association at the present time, it is expected that a section will be started for accounting men. One of the men who has given a lot of thought and time to this phase of the New England Gas Association is Mr. W. A. Doering, auditor of the Boston Consolidated Gas Company.

Mr. Doering responded briefly and urged the members of the Sales Division to get behind the Accounting Division and get at least one man from their accounting department to send in their name to him. Mr. Doering stated that if we can get twenty-five accounting members of gas companies it will be possible to form an accounting division of the New England Gas Association.

In introducing Mr. DeWitt Clinton, the speaker of the evening, Mr. Doering stated that he had known Mr. Clinton for a number of years and that he was very sure the speaker would have something very interesting to say. Mr. Clinton has had very much experience with the subject of Good-Will to Our Customers, having served as chairman of various committees who handle this matter in connection with the American Gas Association.

Employees Can Assist in Promoting Good-Will

Mr. Clinton presented his talk in a very forcible way, bringing out the important point that the employees who come in contact with our customers can do much towards creating good-will for the customers. Mr. Clinton's talk was so well received that the association went on record as being in favor of having this address printed and distributed to the employees of the gas companies.

Following Mr. Clinton's talk members of the association took part in an interesting discussion. Mr. R. H. Jameson, of the Marlboro-Hudson Gas Company, said in part:

"We have all received some fine instruction here this evening from Mr. Clinton's presentation of that important subject, 'Obtaining and Improving the Good-Will of Our Customers.' We should take particular note of his statement that in the minds of our customers the meter readers, the clerks, the cashiers, the bill collectors, the telephone operators, the men employed in the installation department, constitute the company. Those employees who have contact with our customers certainly share in a large measure with the management in obtaining and retaining the good-will of our customers. A real angry customer immediately snatches the telephone to tell the gas company what's wrong, and this type of customer requires skillful handling by the company's telephone operator.

"Another class comes to the cashier's window, and the complaint is usually voiced for the benefit of all present. In either event, if the telephone conversation terminates or if the customer leaves the office without being adequately satisfied, it should be the duty of the manager in small companies or of someone especially designated in larger companies to call upon that customer and adjust the controversy.

"Many complaints are adjusted simply because the gas company supplies the additional facts of which the customer has no knowledge, and I believe that when the customer fails to acknowledge full satisfaction for the explanation accorded to him by the employees, that the slogan should be 'the customer is always right until the gas company has supplied sufficient facts to convince him that he is wrong.'

"Every Complaint Is an Opportunity to Make a Friend"

"I like the slogan of S. M. Kennedy, vice-president in charge of public relation and business development of the Southern California Edison Company, 'Every complaint is an opportunity to make a friend.' I think it is not only necessary to have a good public policy, but it is also necessary to advertise that policy. Barber shops, drug stores, retail stores of every kind, police officers, letter carriers and all other agencies that have contact with the public will assist you in advertising your public policy if you use these agencies to your advantage.

"The gas companies' representatives should take an active interest in community affairs. To sum up what I have in mind, I might illustrate in this manner. Timken roller bearings were not popular with the automobile maker until they advertised directly to the public. Then the automobile owner

(Continued on page 423)

As The Journal Views It

INSULATION FOR THE HOME

It is astonishing how slow people have been to take hold of the idea of insulating their homes against the loss of heat in winter and the ingress of the outside temperature in summer. Plumbing, lighting and other modern conveniences have been carried to a high degree of perfection in the home, but insulation has scarcely more than scratched the surface. Perhaps if insulation were something that showed on the surface, something that could be paraded about to the owner's satisfaction, like a new car, it would have long since come into universal use.

For years house owners and tenants have practised various artifices for making it seem warmer in winter in the home, and cooler in the summer. To this end witness the precipitous placing of woolen rugs on the floor in winter and matting ones in summer. More, note the covering of the heating pipes in the cellar with some sort of insulating material and the use of weather stripping around ill-fitting doors and windows. Even milady must have her hot mats in order to protect the finish of the dining table from the ravages of an overly torrid pot of tea. So it would seem that folks in general are familiar with the undesirable features of the transmission of heat and some of the elementary methods of combating the same.

Why, then, have people continued to remain so abysmally ignorant of the fact that the same principles can be embodied in the construction of the home? Is it a case of indifference, or can it be charged to lack of education and publicity on the part of those formerly best equipped to put across the proper message in this regard—in other words, the architect and builder? We feel that the latter are responsible for the condition.

As a dispenser of education in this wise we hold that the builder can be left out of the reckoning. At best the preponderating majority of such artisans are but carpenters taking a post-graduate course, and, though their ability to lay out a stair or hang a door might be profound, they generally do not rate very high in the application of the simple laws of physics to house equipment. And, as Mr. Bumble might have expressed it, if one is content to leave such matters to the judgment of the average builder, one is "a ass." Some day the average builder might be in a position to act as educator along this line, but at present he had best be left out of the reckoning.

By and large architects are eminently equipped to campaign for the widespread use of insulation and, summing up the extent of their efforts thereto, it might appear that they have been a trifle derelict in their duties. And it is not necessary that a home cost upward from thirty thousand dollars to warrant the expenditure of several hundred dollars for the purpose of insulating its walls and roof. The fact is that 90 per cent of the homes built today can stand such additional expense.

With the advent of gas as an accepted fuel for heating the home, a powerful educational agency has entered the building field. We refer to the strong position the gas industry occupies for spreading and disseminating the best ideas extant as to how a home should be equipped in order to make it most livable.

For a good many years gas companies have been co-operating with the architect to the end that homes are properly piped and provisions made for installing the many needed gas appliances with facility. And, now that house heating with gas is an assured fact, there is additional publicity as well as co-operation with the architect necessary in order that gas house heating might reach the largest possible number of customers. Moreover, co-operation with the manufacturer of insulating material is highly advisable. It seems fitting for gas companies to be in a position to advise their customers as to the proper method of insulating their homes, particularly when they are building and are in consultation with the gas company as to a gas house heating installation. We have in our hands a real opportunity to be of further benefit to the public in a very large way.

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 166

Blue Gas

Blue gas is manufactured in a generator, a general type of which is shown in the accompanying illustration. The generator is generally built in the form of a steel shell which is lined with firebrick. The internal diameter of the generator varies from three to ten feet in accordance with its capacity. The sides of the generator are usually plain and vertical. The foundation of the generator is usually a ring or circle of masonry or concrete. This type of foundation is fraught with the disadvantage that when the ashes are removed from the machine they are scattered on the floor and the men have to work in steaming clinker. Newer types of generators are made with conical bottoms, the generator itself being then supported by ironwork.

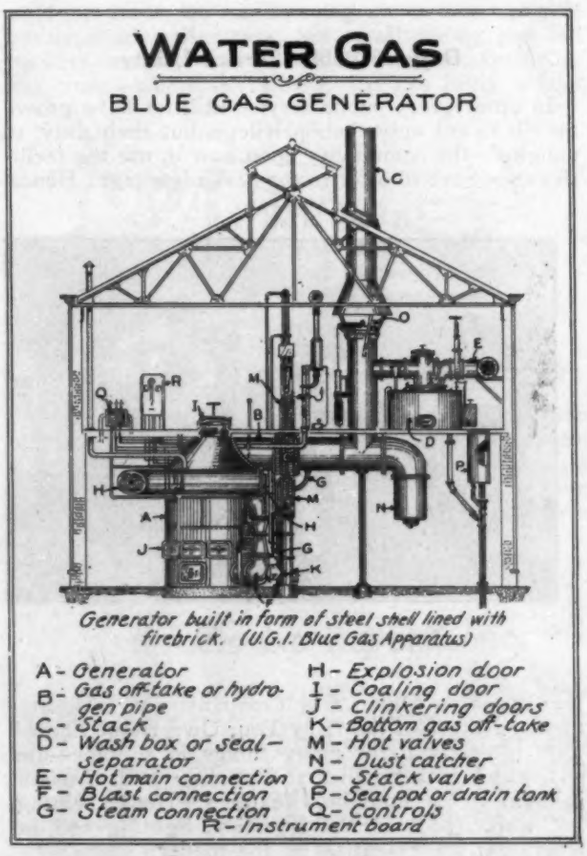
The fuel bed is supported on a grate which is usually located at the level of the bottom of the clinkering door. The grate is usually made of steel or wrought iron bars and these rest on a grate carrier at the centre and on end supports around the sides of the machine. The grates are sometimes made so as to dump. In the smaller types of machine grates may be omitted and then the fuel lies directly on the floor. In such cases the bottom of the generator is made larger so to afford room for the admission of steam and air.

Charging Door

The operating floor of the generator is level with its top and is commonly made of iron or reinforced concrete. The charging door, through which the coal or coke is fed into the machine, is located in the centre of the top just slightly raised above the level of the operating floor. The door is made so that it slides open, and the slide itself moves on a hinge or pivot and rests on a gas-tight ground seat. In large generators doors are provided which move on wheels on a track. Generators are sometimes found with a double door charging bell. This has the advantage of allowing the machine to be charged without interrupting operations, but it also possesses the disadvantage in that it does not permit observation of the fuel bed.

The clinkering or cleaning doors swing in vertical axes, and while in small sets there may be only one door, in large sets there may be six doors in all in two groups of three. Some sets have four doors. These doors are all level with the grate and are made tight by means of asbestos packing and are closed by means of clamps. The clinkering doors, and this applies as well to the coaling door, are lined with firebrick.

The blue gas machine is also equipped with other devices. First there is the gas take-off. This is a large pipe which opens into the generator at the side right close to the top. The stack is located over a vertical pipe which connects with the gas take-off, and this vertical connection is closed by a stack valve, which is open only when the machine is purged. A horizontal connection leads away from this vertical pipe into the wash box, which is filled with water, through which the blue gas is made to pass.



Generator built in form of steel shell lined with firebrick. (U.G.I. Blue Gas Apparatus)

BUY YOUR OWN HOME SHOW

By Jos. W. Piatt

In a vast municipality such as Brooklyn, trade is continually invading residential districts and, through purchase or contiguous intrusion, it causes numbers of families to hunt elsewhere for new homes. Married people and younger ones who are mating all have a dream of ultimately owning their own homes. These factors, together with the incursion of new people into the city, make home building a great activity.

Today, due to the many agencies through which education can be given in these things, home building has become a thing of scientific and artistic development. Structural development involving materials and form has been brought to a high point by architects, so that house planning by the homeseeker is no longer a difficult task. House furnishing is being developed in the same measure. Home functions, such as sanitation, plumbing, lighting, ventilation, heating, cooking and refrigeration, are equally well cared for today.

This is the cause of the Buy Your Own Home shows. In some respects such an exhibition is something in the nature of a window display of a great department store, only, because of its vaster scope, it is much greater in its departmental agencies. Each great factor takes care of its own functional display.

Duty of Public Service Utility

In cities great public service utilities have grown up. It is not only their privilege, but their duty, to enlighten the community upon how to use the facilities they have to offer to the best advantage. Hence,

Brooklyn Union Gas Co. Booth

the Brooklyn Union Gas Company was a departmental feature of the "Buy Your Own Home Show." Fuel is essential for many things in a home—and gas, which is the refined and ultimate fuel, is useful in many of the household features. House heating, hot water, cooking, refrigeration, lighting and incineration are essentials in the modern home.

At this exposition, the Brooklyn Union Gas Company accepted its prerogative in the full spirit of co-operation in modern civilization, and it had a pavilion devoted to gas in the home.

At the entrance to the drill hall of the 23rd Regiment Armory the Brooklyn Union Gas Company occupied a four square space surrounded by aisles, so that all portions were available for public inspection.

Upon this quadrangle was erected a handsome pavilion embellished in Grecian columns of Ionic design. There was a central structure surmounted by a handsome balustrade with ornamental vases at each corner containing large potted shrubs.

The four exterior walls of the structure held insets between the corner column of useful domestic gas-fired appliances. One consisted of a fireplace under whose handsome mantle was inserted a period type of radiantfire heater.

Another displayed a smoothtop gas range, a third wall showed a domestic gas heated clothes dryer for use in the home laundry, an appliance that makes the home independent of weather in this respect. A fourth was the background for storage type water heaters.

Domestic Appliances Featured

Extending from each corner of the central structure to each column ornamented corner of the quadrangle was a double line of domestic gas appliances, each line facing into a court formed by the aisles and diagonals of the quadrangle upon which the exhibit stands. Each court contained an appropriate exhibit for specific demonstration, the four courts being devoted each to the following general demonstration.

The court facing the central aisle contained a home service cooking demonstration which was operated each day by expert dietitians, who instructed the public in the fine art of domestic cooking.

The court facing the end aisle intercepting the armory entrance was devoted to domestic ranges, with a central display of the wonderful new gas-operated refrigerator, which, with no moving parts to give trouble, marvelously proceeding to function in cooling with a precision that is uncanny.

The third court was devoted to sanitation and space heating, where central gas-fired heating plants for house heating were shown. An incinerator was displayed in chief.

The fourth court facing the inner aisle was given over to household storage water heating appliances.

All the exhibits had attendants who are familiar with the installation and use of appliances in the display. They gladly and courteously explained and demonstrated all possible working details of this great exhibition of gas in the home.

All in all, the exhibition was the best and most interesting ever given for domestic purposes, and no visitor in the Buy Your Own Home Show could afford to miss the instructive effort that has been made to give them the latest and best that the gas industry has to offer for utilization in the home.

GAS MERCHANDISING

Domestic – Industrial

Ideas for the Man Who Sells

William H. Matlack

SPRING THE SEASON

With the coming of spring, every where you go you will find the home manager "cleaning"; cleaning out closets, basements, attics and yards—the accumulation of a winter's storing or perhaps a year's—of old clothing, cans, bottles, papers and what not. And why is not this the right time to introduce the appliance that will take care of the job—the home incinerator? Go where you will, you find home managers burning this rubbish. Then why not go to

her and show her how she may do this safely and without the work of carrying it out into the yard or alley. Show her how this appliance will take care of all rubbish and garbage each and every day—burn it without odor or danger. Now is the time to get another appliance on your lines—spring time is incinerator time.

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NOW, TELL US ANOTHER

We wonder just what is being done here and there to stop this deadly decline per meter in domestic consumption. It looks dark as we view it from the tales the travelers bring in, but that is not the bad part: we do not hear that anything is being done to stop this decline—except conversation. So we venture to ask: What has become of the gas iron? It has not slipped from the memory of gas men that we used to campaign on gas irons about every so often; then the war—we might as well blame it on the war as anything else—came. We got busy and when it was over and we settled down again—well, this little appliance was ironed out of the picture; that is, generally speaking. It was another gas appliance, a labor-saver in the home, that helped that per meter sendout—we wonder what would happen if we gave a gas iron with each range sold rather than a set of dishes. We know of one city that must have sold somewhere around one hundred thousand gas irons, we recall seeing street cars carrying gas iron advertisements; we recall seeing gas bill stickers and newspaper advertisements featuring gas irons—where, oh where, are gas irons today?

We think it is a good bet to give a gas iron with each range sold—surely, if only half of them were used it would be worth while, but there is no reason why all of them would not be used if they were properly demonstrated, for they have many features well worth talking about.

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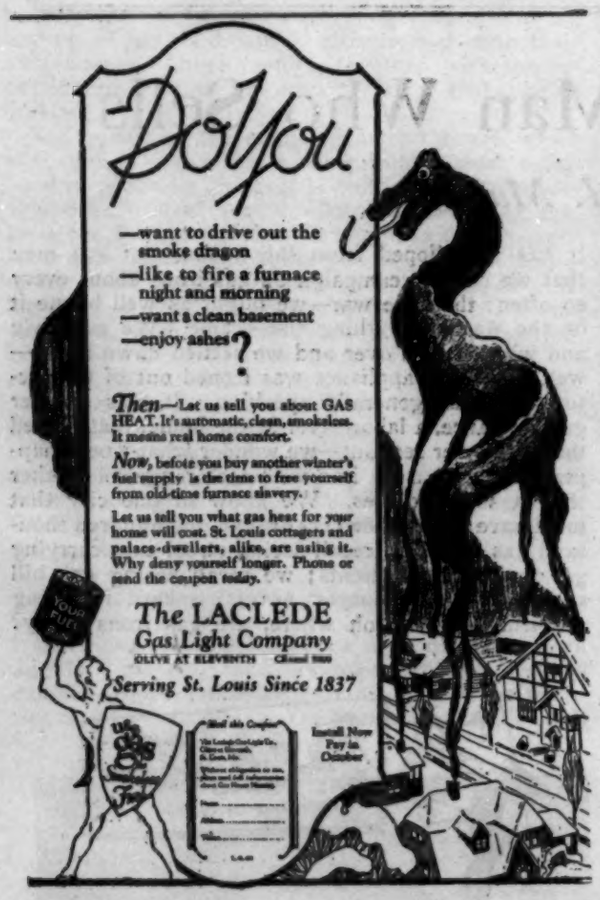
ST. LOUIS AND THE DRAGON

In ye olden tyme it was St. George that we associated with the dragon, but in nineteen twenty-seven we find that St. Louis is the sword-bearer and that "Louie" has a different kind of dragon, if you will; a more ferocious one, to conquer; one that has to be attacked in a far different manner from the one St. George is supposed to have put out of its misery. The St. Louis dragon is a soft coal polluted atmos-

phere, one that all manner of unkind things have been said about on the one hand, and some that are not so unkind on the other. Smoke, say some, is an indication of manufacturing activities; it is a sign that many hundreds of people are employed in


Do You
—want to drive out the smoke dragon
—like to fire a furnace night and morning
—want a clean basement
—enjoy ashes?
Then—Let us tell you about GAS HEAT. It's automatic, clean, smokeless. It means real home comfort.
Now, before you buy another winter's fuel supply is the time to free yourself from old-time furnace slavery.
Let us tell you what gas heat for your home will cost. St. Louis cottagers and palace-dwellers, alike, are using it. Why deny yourself longer. Phone or send the coupon today.
The LACLEDE
Gas Light Company
OLIVE AT ELEVENTH
Serving St. Louis Since 1837
Install Now Pay in October

industry, transportation, and distribution. It is the sign of a healthy (commercially speaking) community. Then there is the other coterie who say it is an unhealthy symbol; that the life of property, vegetation and of human beings is shortened materially by soft coal smoke. Be that as it may, the Laclede Gas Light Company standing on the side lines has taken advantage of what is being said about the smoke nuisance to exploit gas as the ideal fuel for house heating. Instead of fighting the subtle enemy with a sword, Laclede is using a fuel bin.

The advertisement which we are reproducing here tells the story in a big way, especially to the folks residing in "The Billionarea," where smoke abatement is being given a lot of publicity, pro and con, these days.

There can be no question about **gas being the real solution** to the problem of smoke and soot abatement. And, as we view it and understand it, if only the domestic smoke belching equipment used in heating can be converted from soft coal to gas, the smoke of industry in America's workshop, the East St. Louis industrial area, would be of little concern. At all events, our purpose is to tell gas men here and there that one company is alert to and taking advantage of the current headliners to tell the story of **gas, the smokeless fuel.**

Oh boy!
What a world that coal-and-ash-burdened basement may be transformed into—what a clean, livable play room, den, workshop, drying room or cozy retreat for dancing—if you will but "Let the Pup be the Furnace Man"—install a Bryant Gas Boiler or Warm Air Furnace.
A good, automatic gas heating plant needs no more care than a pup can give it—not even a thought of attention for days and weeks at a time.
Gas heating's wonderful comfort and convenience are well within reach of most home owners.
Let us tell you of the carefree heating service you can enjoy by letting the gas company heat your home. Write for a copy of our latest gas heating booklet—or, let our House Heating Department furnish you with facts and figures FREE!
Phone Bridge 1041
Illinois Power and Light Corporation
414 Missouri Ave.

✡ ✡ ✡ ✡

A TIMELY TIE-IN

The House Heating Departments of several gas companies, here and there, are tieing-in to the advertising done in the popular magazines. One of those to do this to the fullest extent is the Illinois Power and Light Corporation. This company tied-in with the manufacturer in a big way in March. The manufacturer opened his campaign with a full-page advertisement in the Saturday Evening Post of March 19th and simultaneously the Light and Power Company throughout the Southern Division set up window displays, ran newspaper advertising and sent out special letters to prospective customers, all using the same illustration as used by the manufacturer in his national advertising. This is about as good a follow-up as we have ever seen, and

for that reason we are passing it on to others who may wish to tie-in to other national advertising.

BRYANT
GAS
HEATING
The Pup is Furnace Man
GAS heating is clean, reliable and absolutely automatic. Your pup can be the furnace man—That's all the furnace tending you'll need. The basement can be transformed from a drab, grimy spot, to be visited only upon necessity, into a cheerful, livable part of the home—a cozy retreat for playing cards or reading, a clean, usable workshop, a healthful playroom for the youngsters.

DRAWING FROM ADVERTISING ILLUSTRATION BY WM. MEADE PRINCE IN THE SATURDAY EVENING POST

ILLINOIS POWER AND LIGHT CORPORATION

SOUTHERN ILLINOIS DIVISION

HOUSE HEATING DEPARTMENT

To the Man Who Enjoys
Home Comforts:

April first!
The annual threat of a coal strike lifts its ugly head-----you have just thought to banish coal, firing of furnace, ashes and dirt, for six months to come-----no one cherishes the memory of playing fireman and ash heaver during the past winter. The very thought of these things provoke you to the point where you would indulge in plentious explosive expletives.

Still, this would not solve the perplexing problem, will not keep down the cost of coal, furnish a fireman or alleviate the ash problem-----nor assure you an adequate fuel supply when and where you need it.

-----but there is a simple solution--

"You can do it better with GAS"-----do it automatically, banish all these worries, discomforts, dirt and labor.

Install a Bryant boiler or Warm Air Furnace in your home. "Let your pup be your furnace man." The Bryant systems are automatically controlled. They need no attention-----GAS for fuel is convenient, clean and there is no waste-----stored away from your home-----ready whenever you need it-----with no investment----- you pay for your fuel after, not before, you use it-----and best of all, month in and month out the cost per thousand cubic feet (565,000 B. t. u.) remains the same.

Why delay next winter's comfort longer? Pick up your 'phone -----let Your Gas Company furnish FREE facts and figures----- tell you how to banish tedious cellar drudgery and turn your basement into a play room for the youngsters.

Expectantly yours,

ILLINOIS POWER AND LIGHT CORPORATION
By B. P. Mulley

WHM/327 House Heating Department

FOR BETTER PUBLIC SERVICE

Note the manner in which the letter and newspaper advertisement maintained the general theme and at the same time wove in a touch of local color.

The newspaper advertisements were 3 col. x 140 lines and the letters were of the 3-page illustrated type.

MISS HUTTON OF WESTCHESTER LIGHTING COMPANY CONCLUDES LECTURES

Miss Margaret Hutton, B. S. domestic science director, home service division of Westchester Lighting Company, completed a series of ten lectures in the Lighting Company's auditorium, 45 South Broadway, Yonkers, New York, Thursday afternoon, March 10. Miss Hutton's final lecture was "Unusual Cakes." The crowded audience gave "Baked Alaska" an ovation. This ice cream cake covered with meringue and placed in the oven with the dial at 500, when taken out with the meringue brown and the cream unmelted stirred the skeptical to an unusual degree. "Baked Alaska" made the hit of the afternoon.

The women who attended Miss Hutton's series of lectures gave her a material proof of their appreciation of her efforts to teach them the arts of cookery by presenting her with a beautiful leather handbag.

The home service division of the Lighting Company gave all the women who had attended the complete series of lectures, the choice of either a leather bound book of recipes, included in the series, or a toaster. There were 49 women with 100 per cent attendance.

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COOKING DEMONSTRATED IN ALLENTOWN

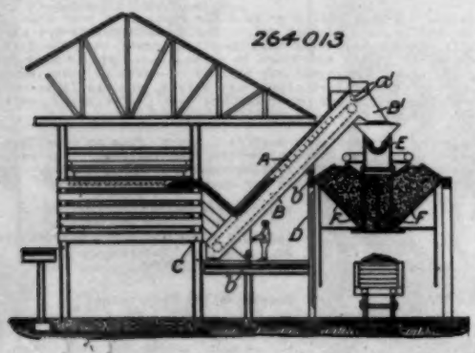
The Allentown Bethlehem Gas Company recently featured Mrs. Florence Gray, nationally known cooking school expert, and domestic teacher in a demonstration of modern cooking and appliances in the Hamilton Street salesroom of the company.

Mrs. Gray demonstrated the new insulated and ventilated gas range. She cooked meals, did plain and fancy cooking and baking, making use of her own recipes.

PROGRESS IN GAS TECHNOLOGY
Domestic and Foreign

QUENCHING COKE

COKE, discharged from retorts C, is quenched on an inclined endless conveyor A, which is enclosed within a casing B, which is mounted on wheels running on rails b and projects through or extends over the wall D of the retort house. The casing B has a downwardly directed outlet B^1 which delivers to a traveling screen F, from which the graded coke is fed to bunkers F formed of non-corrosive reinforced brick or concrete. The steam



generated during quenching escapes to the atmosphere outside the retort house through the upper end of the casing B, a balanced valve a^1 being provided to maintain the interior of the casing at a slight pressure. British Patent No. 264,013.

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VARIABLE COMPOSITION OF COKE OVEN GAS ON COMBUSTION

A STUDY has been made on the influence of the variable composition of coke oven gas on its economical combustion. The composition of coke oven gas depends on the pressure that is maintained in the oven, the external wind pressure and the direction, the coal used, the coking temperature, and other factors, and is therefore subject to considerable variation. Analyses, calorific values, densities, volumes of products of combustion, volumes of air required for combustion, theoretical flame temperatures, etc., are tabulated for twenty samples of gas taken from a coke oven plant at various times during its operation over a period of six months. No simple relation exists between the calorific values and the densities of the gases.

The volume of air required for combustion and the total volume of combustion products are approximately linear functions of the gross calorific value. The carbon dioxide content of the flue gases bears no relation to the calorific value and gives no accurate measure of the excess air. The influence of the amount of excess air on the flame temperature and the heat losses, and the variation of these when a burner is supplied with gas of varying pressure and composition are discussed.

For economical combustion good pressure regulation is necessary. At constant pressure, fluctuations in the gas supply may occur owing to variations in the density, and even at constant density the excess air in the flue gases may vary owing to the varying air requirements of the coke oven gas.

For the gases tabulated, the maximum variation due to these causes is not greater than that due to a pressure difference of twenty-five millimeters of water. Similar calculations have been made for two series of gases of varying composition, but of constant calorific value and constant density respectively. Comparison of these shows the latter to have the advantage, gases of the same calorific value, being capable of greater variation in their behaviour on combustion than gases of the same density. In evulating a gas the density and carbon dioxide content as well as the calorific value must be taken into consideration. Das Gas und Wasserfach, volume 69, pages 1135 to 1141.

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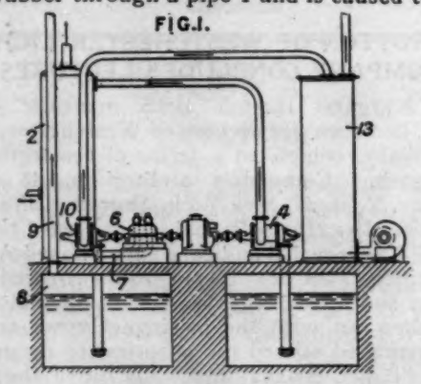
PURIFYING COAL GAS

COAL gas at high pressure is washed with a large volume of cold water in a scrubber 2, which contains screens, rings, etc., impurities such as sulphuretted hydrogen and carbon dioxide forming unstable hydrates. The water issues from the scrubber through a pipe 1 and is caused to rotate

FIG.1.



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a Pelton wheel or turbine 6 before discharging into a tank 8. Disengaged gas passes to a stack 9. The water is delivered by a pump 10 to a tower 13, in which it is subjected to an air blast while flowing

over piled-up material. The cleansed water is returned to the scrubber by a pump 4. British Patent No. 263,830.

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STUDY OF WATER GAS PROCESS

AFTER a short discussion of the general practice of making water gas, various thermal balances are introduced to show the distribution of heat during the process and the thermal efficiency. Thus, for example, this balance is written as follows:

Therms per 1,000 cubic feet of blue water gas made:

Heat Supplied—	
1. Coke	2.197
2. Steam (total heat)	0.386
3. Total	2.583
Heat Removed—	
4. Water gas, potential heat	2.960
5. Sulphuretted hydrogen, potential heat	0.021
6. Water gas, sensible heat	0.171
7. Steam not decomposed, total heat	0.163
8. Radiation, etc.	0.069
9. Total	3.384

10. Net heat removed from the bed of fuel 3.384-2.583, or 0.801 therm.

The figures were obtained in the following manner:

1. The carbon content of 1,000 cubic feet of blue water gas was 14.29 pounds and the percentage of carbon in the coke (moisture-free) supplied to the generator was 82.1, so that the weight of dry coke converted into 1,000 cubic feet of water gas was $\frac{14.29 \times 100}{82.1}$ or 17.406 pounds. The determined calorific value of the dry coke was 12,620 B.t.u. per pound; therefore, the heat value of 17,406 pounds is $\frac{17{,}406 \times 12{,}620}{100{,}000}$ or 2.197 therm.

2. The total heat of the steam supplied is made up of sensible heat and latent heat of the steam.

4. The potential heat value of 1,000 cubic feet of blue water gas was obtained from the determined calorific value.

5. The volume of sulphuretted hydrogen produced per 1,000 cubic feet of purified water gas was made 3.3 cubic feet, and the calorific value used in the calculation of this item was 136,000 gram calories per gram molecule.

6 and 7. These figures represent the sensible heat in the water gas at the temperature at which it left the generator and the total heat in the undecomposed steam at the outlet of the generator.

8. The heat lost by radiation, etc., has been assumed to be 2 per cent of the heat value of the total fuel supplied to the generator, and this is equivalent to 0.069 therm for the time occupied during run periods in the production of 1,000 cubic feet of blue water gas. Journal of the Society of Chemical Industry, 1927, pages 72T to 76T.

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GAS SALES DIVISION HOLD APRIL MEETING

(Continued from page 415)

began inquiring for a car with a Timken rear end Then the demand made by the public for Timken bearings was reflected in the sale of that product to the automobile maker. Sell your company's policy over the heads of those in City Hall directly to those you serve and you will have little to fear, no matter which side is elected. If you receive a report of a gas leak in your mains, a service truck should be dispatched with all haste to make the necessary repairs, because the gas lost costs money and escaping gas may do somebody harm. The conduits that return the customers good-will develop leaks also, and if the manager is on the job to repair these leaks he will stop escaping gas that will otherwise create the harm.

Good-Will Profitable

"Many gas companies that are on the right side of the ledger would be on the wrong side if they lost the good-will of their customers. Establish the most liberal extension of credit during periods of depression when unemployment makes it impossible for many of your customers to pay their bills. Not one in ten will fail to pay you when times are better, and the margin between cost and selling price on the other nine will not only make up the loss on the ten, but will add greatly to your good-will reservoir."

In the discussion which followed several of the members brought out the importance of selling the company's securities to customers, information to the public about the gas company, their activities, new developments, etc. The point was also brought out that it was important for members of the gas companies to speak before local clubs, chambers of commerce, etc., and do everything they can to bring the company before the public in the right light.

Mr. Clinton's address will appear in an early issue of the American Gas Journal.

How One Manufacturer Advertises Gas

NEWS OF THE GAS INDUSTRY

Mr. Waring Heads Large Argentine Gas Company

Announcement is made in the Grand Rapids Spectator that George H. Waring, chairman of the public utilities committee of the Association of Commerce, is to be president and chairman of the board of directors of a $1,200,000 corporation which is to build a modern gas plant in Rosario, Argentina, a city of 400,000 population.

Mr. Waring went to Argentina a year ago, when he put in an application with the Rosario municipality for a franchise to build a plant to manufacture and distribute gas. This franchise being granted, he went back to South America last November. In his second trip he purchased a tract of land upon which to erect the plant and purchased the old gas mains of a company which had ceased operating in 1916. He then went to Europe, where he arranged for the financing of the company. He returned to Grand Rapids a few days ago and is now making plans and specifications for construction of a water gas plant at Rosario.

An Argentine company is to be formed, of which he is to be the head, as well as acting as its consulting engineer. E. P. Davis, manager of the Holland, Mich., Gas Company, has been made manager of the Rosario corporation and will sail May 7 to take charge of the property. Mr. Waring expects to visit Argentina annually during the next few years to exercise general supervision of the establishment. The Rosario company will be capitalized at $1,200,000, with no bonds. All its stock has been subscribed. The company's franchise specifies that the gas plant shall be completed in two years, and it is expected that operations will begin in 1929.

Mr. Waring is a gas consulting engineer of national recognition. He has been president of the Michigan Gas Association and has been vice-president of the American Public Utilities Company. In 1924 he was engaged by a group of international capitalists to make an inspection of and complete report on the Primitiva Gas Company of Buenos Aires. During his recent visit to Europe he went to Germany and Holland, to look into new processes for complete gasification of coal, and he is now preparing a report on these processes.

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Central Foundry Company to Move to Graybar Building

The Universal Pipe and Radiator Company and its subsidiaries: The Central Foundry Company, the Central Radiator Company, the Molby Boiler Company, Essex Foundry and the Central Iron & Coal Company, in keeping with their rapid expansion and nation-wide service will occupy new spacious quarters, on and after May 1st, in the Graybar Building, New York's monumental office building adjoining Grand Central Terminal.

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Geo. W. Thompson Retires After 40 Years' Service

Announcement has been made of the retirement from active service of George W. Thompson, formerly manager of the 15th Street District Office of the Consolidated Gas Company of New York. Mr. Thompson has been in active service of the company for approximately 40 years. He has been succeeded by W. D. MacFarlane, formerly assistant manager.

Other promotions announced by the company are: Mr. J. F. Kane from chief clerk to assistant manager, and Mr. R. J. Phillips from assistant chief clerk to chief clerk.

A Water Heater Specialist With a Colorful Background

The Ruud Manufacturing Company announces the appointment of Mr. E. D. Pearson as their district manager in New Orleans, La.

Mr. Pearson was born in Attica, N. Y., and educated in Buffalo. He spent several years fighting in the Philippines, French Indo-China and China during the Boxer rebellion.

Mr. E. D. Pearson

He served as plumber apprentice with the W. G. Cornell Company, New York, and as journeyman at the U. S. Military Academy.

The New Orleans branch has been but recently opened and the fact that Mr. Pearson with a very colorful background is located in a very colorful community augurs well for the future growth of the New Orleans branch.

American Gas Association Appropriates Ten Thousand Dollars for Research in Use of Gas for Steel Treating at University of Michigan

Ann Arbor, Mich.—Receipt of an appropriation of $10,000 from the American Gas Association for a program of intensive research in the use of gas for steel treating at the University of Michigan was announced by Prof. A. E. White, head of the department of engineering research.

A specialist in metallurgy and a staff of laboratory assistants will immediately start a series of investigations into the uses of gas for heat treating of steel and in forging furnaces, Prof. White said. The work, which will be undertaken in co-operation with the Surface Combustion Company, will be under the direction of Professors A. H. White and A. E. White.

"Use of manufactured gas for heating operation is constantly increasing," Prof. White said, "because of the readiness with which gas lends itself to automatic control.

"While this work is being done for the American gas industry, the results will probably be of great direct value to Michigan industries. This will be particularly true of the automobile industry, because of the immense amount of heat-treated metal employed in it.

Comments by Alexander Forward

"This appropriation is taken from our special fund of $500,000 to be used in a five-year program of research in the field of large scale industrial use of gas," Alexander Forward, managing director of the American Gas Association, said in a telegram to the engineering research department.

"We are especially happy to include the University of Michigan in this program and we are confident that the work to be carried on there will further reflect its high standing as an educational institution. I extend to Professor White and his associates my congratulations on the termination of an agreement which will bring his institution in closer contact with the entire manufactured gas industry."

Convention Calendar

April

26-29—Southwestern Public Service Association. Annual meeting, New Orleans, La. E. N. Willis, secretary, 403 Slaughter Bldg., Dallas, Texas.

May

5-7—Missouri Association of Public Utilities. Location to be selected later. F. D. Beardslee, secretary, 315 North Twelfth Street, St. Louis, Mo.

6-7—Pacific Gas Association. Northwest Regional Conference, Hotel Davenport, Spokane, Wash. Clifford Johnstone, secretary, San Francisco.

9-11 Natural Gas Association of America. Annual meeting, Cincinnati, Ohio. Guy F. Batchelor, secretary, 904 Oliver Bldg., Pittsburgh, Pa.

19-21—Indiana Public Utility Association. Annual meeting Gas Section, French Lick Springs Hotel, French Lick. E. J. Burke, secretary, 1270 Peoples Gas Bldg., Chicago, Ill.

25-28—New York Regional Sales Conference. Annual meeting, Lake Mohonk Mountain House, Lake Mohonk, New York.

31 & June 1—American Gas Association. Production Conference of Technical Section, Detroit, Mich.

Factors considered by the gas association in selecting Michigan for this work are:

Excellent facilities are available in the laboratories of the university for prosecution of this study.

The university is almost in the center of the steel-treating industry—a large percentage of the work of this character in the United States being done in factories located within a radius of 50 miles of Detroit.

* * *

Engineers Hear Talk on Gas and Coke

The Nashville Engineering Association in weekly luncheon meeting at the Chamber of Commerce heard a discussion of gas and coke manufacture by Ralph E. Van Kleeck, assistant engineer of the Nashville Gas Company.

Gas Co. Plans Show Growth of District

Detroit, Mich.—"The growth of our business in Detroit is much larger than in the country at large," said A. H. Anderson, of the Detroit City Gas Company, speaking before the general sales meeting of the Huston-Mortenson Company. He said :

"In spite of great advances in the prices of labor and material since the war, we have kept the price of gas to the consumer at practically the same price through improved and efficient methods. The biggest part of our investment are the lines buried in the ground. Our most modern plant is the one we call the River Rouge plant, commonly known as the Melvindale plant. Perhaps you have wondered why it is painted red. The Ford airport officials requested this because, rising 290 feet in the air, it makes an excellent beacon for aviators landing there, particularly since a huge white arrow is painted on the top pointing to the airfield.

"The capacity of our River Rouge plant is ten million cubic feet per day and can eventually be increased to 100 million. We have looked into the great growth of the southwest section of the future and have prepared to meet it. In 1926 we installed 345 miles of mains to service 23,600 houses, a distance equal to that from Detroit to Milwaukee, circling Lake Michigan."

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Commission Approves Amendment to Tariff for Gas Service Supplied in Corning

Albany. — The Public Service Commission has approved an amendment to the tariff of the New York Central Electric Corporation for gas service supplied in the city of Corning. Discount period changed, providing for an allowance (10 cents per M. C. F.) to be made on bills paid within ten days from date of billing for gas consumed during the preceding month. Effective April 11, 1927. Present discount period is on or before the 15th day of month for gas consumed during the preceding month.

Thayer Bill Vetoed

Albany.—Governor Smith vetoed the Thayer bill, entitled "An act to amend the public service commission law, in relation to the installation of appliances or devices on gas or electric pipes, wires, conduits or ducts." In a memorandum accompanying the veto the Governor said:

"This bill is disapproved upon the ground that whatever may be said for its merits, it is too broad and drastic in its effect, inasmuch as it not only repeals all ordinances of villages, towns and cities heretofore made, but it also repeals all orders and rules of state officers, departments, boards or commissions, in relation to any appliance or device to be installed on the pipes, wires, conduits or ducts furnishing, distributing or transmitting gas or electricity, and destroys the ordinance power of some sixteen cities in this relation.

"Further the criticism directed against the local operation of the ordinances which this bill seeks to repeal applies rather to administration than to the lawfulness and constitutionality of such ordinances which have been upheld by the courts.

"The bill is unanimously disapproved by the State Industrial Commission, as it would have for its effect the prevention of the making of all amendments to the factory code dealing with devices on gas and electric wires, pipes, conduits or ducts. It is opposed by the Conference of State Mayors, and, of course, meets with the very violent opposition of the City of New York as indicated by an exhaustive memorandum filed with the bill by the Corporation Counsel.

"If there are any defects in the ordinances or they are undesirable, the place to repeal them is at the hands of the local authorities who enacted them.

"For the above reasons, the bill is disapproved."

Public Service Electric & Gas Co. Promotions

Newark, N. J.—Announcement has been made by Public Service Electric and Gas Company of the following promotions in the gas department:

James M. Lane to be inspecting engineer, general office. Mr. Lane was engineer of manufacture at the Market Street gas works, Newark.

Robert H. Philipps, Jr., transferred from Hudson to Essex Division as engineer of manufacture.

James H. Neighbour to be engineer of manufacture, Hudson Division. Mr. Neighbour was superintendent of manufacture, Trenton.

Philip H. Bean transferred from Hoboken works to West End works, Jersey City, as superintendent.

J. V. Richards transferred from West End works, Jersey City, to the Brunswick Avenue works, Trenton, as superintendent.

L. Martin Harris transferred from Summit-Morristown district to Englewood, as superintendent of gas distribution.

Arthur C. Cherry to be superintendent of gas distribution, Summit-Morristown district. Mr. Cherry was assistant to the engineer at the Newark gas distribution department.

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ROPER TO PUT ON NIGHT SHIFTS

Record Rush of Business Reported on New Line of Gas Ranges

Rockford.—Record business will necessitate the operation of a night shift at the George D. Roper Corporation plant, according to announcement by officials.

All departments where extra help is needed will begin working nights. The organization is now hiring approximately 750 men.

Announcement of a new line of ranges last December has resulted in steadily increasing business. Ranges are being manufactured here at the rate of 300 a day.

M. P. Roper, president of the concern, states that business is much better now than it was at the same time last year.

WOMEN VOTERS WILL CONSIDER GAS LEASE

Representatives of Natural Gas and Present Artificial Company to Speak

Jackson, Miss.—The April meeting of the League of Women Voters at the Y. W. C. A. will be open to the public, and a cordial invitation is extended to all interested in the coming natural gas franchise election to be held on the eighteenth of the month, to be present.

In line with its policy of securing a presentation of both sides of public questions, the league has requested T. L. James, of Ruston, La., to send a representative to this meeting to discuss the possibilities and advantages to result from the granting of the franchise. Hugh Critz, of the Mississippi Power and Light Company, will represent the question from the point of view of the company now distributing gas in Jackson.

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C. J. DeMers Becomes Manager of Sumter Gas & Power Co.

C. J. DeMers, who has for the past year acted as Secretary of the Chamber of Commerce of Huntsville, Ala., has taken over the position of manager of the Sumter Gas & Power Co., Sumter, S. C.

Beginning his career in the gas business during 1907 with the Consumers Gas & Fuel Co. at Atlantic City, N. J., Mr. DeMers then went with the Wilmington Gas Co., of Wilmington, Del., later accepting commercial work with the Standard Gas Company, which supplied twenty-six towns in Monmouth County, N. J.; also acting as local manager at Keyport, N. J. During 1920 he accepted the position of general manager of the Huntsville Gas Co., at Huntsville, Ala., and after successfully operating this property for six years, he sold it for the owners and was then requested by the citizens to remain in Huntsville and take over the management of the Chamber of Commerce.

However, after one year of civic work, a longing to re-enter the gas business resulted in his accepting management of the Sumter Company.

Home Service Committee of Empire Gas & Electric Association Entertained at White Plains

The home service division of the Westchester Lighting Company entertained the home service committee members of the Empire Gas & Electric Association for luncheon at the White Swan Inn, White Plains, New York, Monday, April 4th. Each month the committee meets at a different central station, where the members of the committee discuss the progress of home service activities. Miss Maye Lovel of the Consolidated Gas Company is chairman.

The guests at the luncheon were:

Miss Ruth Soule, home service director; Miss Magonigle and Miss Grant, Brooklyn Union Gas Co.

Miss Doris Scott, home service director, New York & Queens Electric Co.

Mrs. W. H. Hunter, appliance bureau, New York & Queens Electric Co.

Mrs. Hugh Emmons, home service director, Mrs. Haas, Kings County Lighting Company.

Mrs. Marjorie Pigeon Wardman, home service director, Brooklyn Borough Gas Co.

Miss Maye Lovell, home service director, and Miss Naomi MacDonald, Consolidated Gas Company.

Mrs. Cecil G. Harvey, director in charge; Mrs. Sarai Waugh, lighting specialist, and Miss Margaret Hutton, B. S., Westchester Lighting Company.

Brooklyn Borough Gas Co. Increasing Shares

Albany. — Brooklyn Borough Gas Company, Brooklyn, has filed a certificate in the office of the Secretary of State increasing number of shares and changing its par value from 50,000 shares common non-par value, 5,000 shares preferred cumulative stock $100 par value and 10,000 shares participating preferred stock $50 par value, to 30,000 shares preferred stock $50 par value and 50,000 shares common stock non par value. Whitman, Ottinger & Ramsen, Conlon & Goetz, 120 Broadway, New York City, are attorneys for the corporation.

Gas Price for Large Consumers to Be Reduced

North Attleboro. — The North Attleboro Gas Light Company will make a reduction in the price of gas to the large consumers. The amount of the cut was not known, as definite figures had not been received from the Boston office of the company.

The company is owned by a large holding concern, which purchased the local stock about eight months ago. The cut will for the most part benefit the manufacturing jewelers, who are large users of gas.

GAS FIRM GIVES REPORT

More Than Billion Cubic Feet Gas Used in 1926

Des Moines, Ia.—Des Moines used more than one billion cubic feet of gas during the twelve months just closed, according to the annual report of the Des Moines Gas Company, which was made public to the company's 30,000 local customers recently.

The report shows that one of the largest single items of cost during the last year was for taxes. Nearly 20 cents in tax was paid for every thousand cubic feet of gas produced by the company. The total of city, county, state and federal taxes paid by the company in the last twelve months was $197,474.88, the report showed. This was 19.73 cents for every thousand cubic feet.

Further expansion of service to all parts of the city is shown by the report, which lists 69,509 feet of gas mains laid, making a total of more than 312 miles of mains now in use serving Des Moines and Valley Junction.

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Bradenton Gas Plant Sale Meets Disfavor

Bradenton.—While no vote was taken, citizens assembled in mass meeting at the court house, indicated they do not favor the sale of the municipal gas plant to John A. Reed, of Cedar Rapids, Iowa.

The meeting, presided over by President W. A. Manning, of the Bradenton Chamber of Commerce, was thrown open for a general discussion following a report by E. W. Darling, named by the trade board to prepare data for the meeting. E. B. Rood, C. C. Street, Lee S. Day, P. D. B. Stansell, Josiah Varn, C. W. Ward, E. P. Green, Sr., and President Manning spoke in favor of the retention of the plant. Mr. Darling, making the trade board's report, H. F. Tabor and Melvin Hix favored the sale.

The offer by Mr. Reed which was approved by the City Council was to purchase the plant for $250,000 cash. An election is to be held in April, when the taxpayers will be given an opportunity to accept or reject this offer.

WEST KEENE RESIDENTS TO HAVE GAS SERVICE

Public Service Co. to Spend $20,000 on Extension and Work Starts Soon

Keene, N. H.—Immediate extension of gas mains to West Keene is planned by the Public Service Company of New Hampshire, in one of the largest service projects of its kind in the city, to cost approximately $20,000, according to announcement at the local office.

The decision on this project has been reached after several surveys by the old Keene Gas and Electric Company, and a more recent one by engineers of the new company, and a canvass of the West Keene section showing 125 or 150 residents ready to take the service upon completion of the extension. The new gas mains are also made possible by the increased plant capacity with the construction of the new tank and buildings at Emerald Street two years ago, and are in line with the policy of expansion planned by the new company.

A petition will be presented to the city government at the next meeting for necessary permission for trenching the streets, and orders have been placed for materials that work may get under way within two weeks. The work will be under the direction of William Cotter, gas foreman of the local plant, and it is expected that two or three months will be required for completion of the extensions.

The survey of materials to be used calls for approximately 2,200 feet of eight-inch pipe, 2,500 feet of six-inch pipe, 7,500 feet of four-inch pipe, 4,000 feet of inch and one-half service pipe.

More than 1,200 pounds of oakum will be used for packing joints. The pipes will be laid three to four feet deep.

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Home Incinerator Co. Appoints Sales Representatives

Mr. J. P. Van Hook, well known in eastern gas circles, will represent the Home Incinerator Company in the eastern territory, New York to Washington. The Home Incinerator Company also announces that Mr. W. J. McCarthy is now representing them in New England.

Semet-Solvay Engineering Corp. Receives Contract for Work in Atlantic City — Other Construction Activities

Atlantic City.—America's famous playground will greet its visitors this summer with a greatly augmented gas plant, to keep pace with the quality and demand for fuel required to serve this popular resort. Contract has just been awarded the Semet-Solvay Engineering Corporation of New York for the immediate installation of a washer cooler, capable of treating 300,000 cubic feet of gas every hour. Work is being rushed as the equipment is planned to go into service by June.

Semet-Solvay is also building for the Atlantic City Gas Company 30 stacks of Steere cooling coils. They will be especially treated to withstand the chemical action of saline water at the seaboard. When completed and used to its maximum, this equipment will be able to handle 400,000 cubic feet of gas every hour, or almost ten million cubic feet a day.

Cleveland.—Work is progressing rapidly on the installation of an outside purifier for refining coke oven gas at the Otis Steel Company's plant here. The purifier, measuring 35 by 78 feet, will care for 24,000,000 cubic feet of gas daily, or one million an hour. An elevator for handling oxide and a gantry crane for moving covers are parts of the modern equipment. The installation is being made by the Semet - Solvay Engineering Corporation of New York.

Nantucket, Mass.—Work is progressing rapidly on the construction of a complete plant for the manufacture of water gas for this historic fishing and resort community. The Semet-Solvay Engineering Corporation of New York is building for the Citizens Gas, Electric and Power Company, which serves this county, a unit capable of producing 400,000 cubic feet of gas daily. The plant will be of the most modern type known today, equipped with the backrun and other recent improvements for economical operation. It is planned to have the machine supplying gas by early summer.

Gas Machinery Company Receives Orders for Breeze Collectors and Benchwork

The Gas Machinery Company of Cleveland, Ohio, has received orders for the following breeze collectors:

2 Breeze Collectors, Madison Gas & Electric Co., Madison, Wis.

2 Breeze Collectors, Jacksonville Gas Co., Jacksonville, Fla.

13 Breeze Collectors, New Orleans Public Service Co., New Orleans, La.

These breeze collectors for stacks of water gas apparatus prevent the breeze and dust from being blown over into holder cups on to roofs and into the yards and neighboring premises.

Orders have been received for bench work with silica retorts and settings to be installed in the gas works at Canandaigua, New York; Milton, Pa.; Lock Haven, Pa., and Bloomsburg, Pa.

Section silica retorts and settings now have been installed in gas plants since 1910 and they are practically entirely replacing the clay retorts and settings which were formerly used.

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Western Gas Construction Co. to Rebuild Holder for Laclede Gas Light Company

The Laclede Gas Light Company of St. Louis has recently contracted with the Western Gas Construction Company of Fort Wayne, Ind., to rebuild their 1,000,000 cu. ft. holder at Station "A."

The repairs consist of tearing out and replacing the present lifts, dismantling and replacing the guide frame and leveling up the tank. The new guide frame to be furnished with be of the "H" beam type which gives maximum strength with a minimum weight.

Work on the job is to start immediately and be completed early in fall.

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Parley Called on Natural Gas

Los Angeles.—A conference to consider the natural gas situation with a view of improving the service in Los Angeles has been called by the Board of Public Utilities and Transportation.